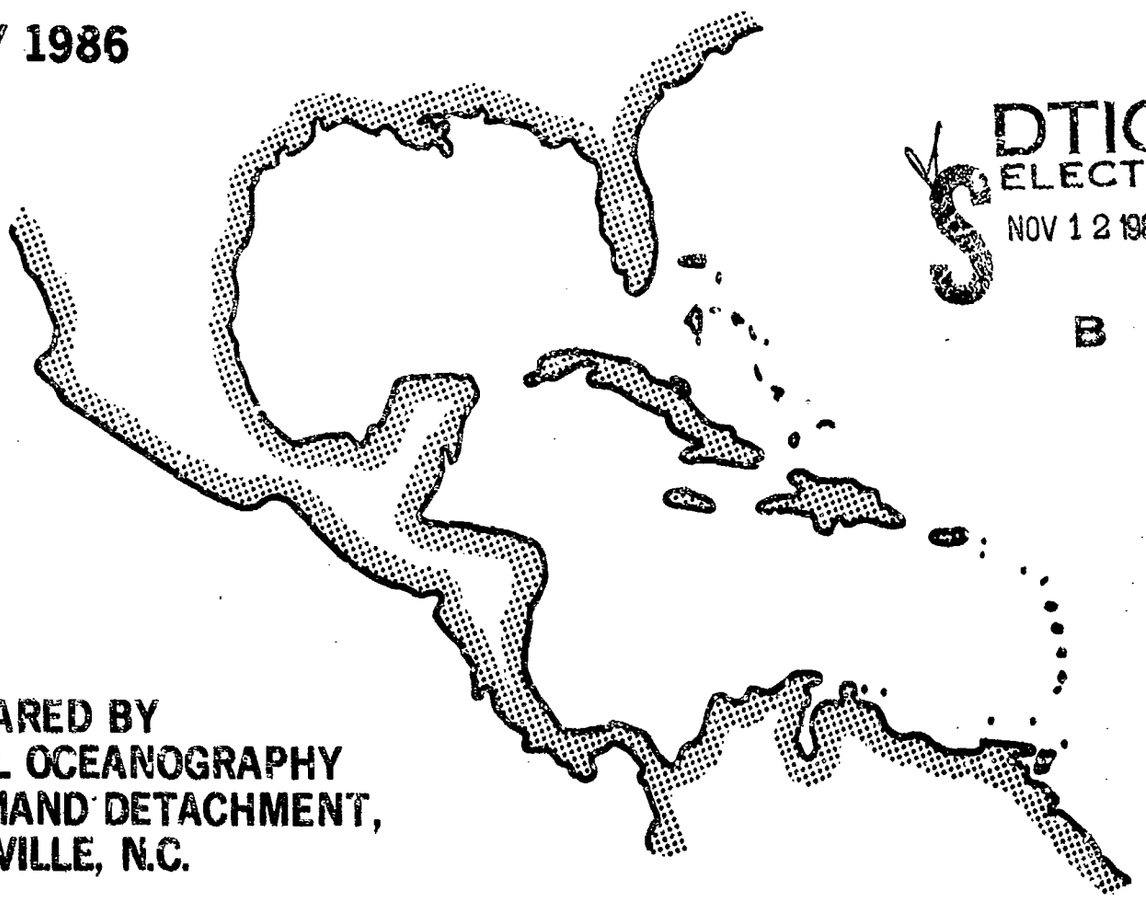
U.S. NAVY CLIMATIC STUDY OF THE CARIBBEAN SEA AND GULF OF MEXICO VOLUME 3

FLORIDA COASTAL WATERS AND SOUTHWEST ATLANTIC

JULY 1986



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This climate study consists of monthly charts and tables of (1) clouds, (2) precipitation, (3) visibility-tables, (4) ceiling-visibility (mid range/low range), (5) wind-visibility-cloudiness, (6) scalar mean wind speed, (7) wind speed less then 11 and greater or equal to 34 knots, (8) wind speed 11-21 and 22-33 knots, (9) surface wind roses, (10) air and sea temperature, (11) wave height-isopleths, (12) wave height-tables, (12) surface currents (seasonal).

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Carolina. The work was performed at the National Climatic Data Center (NCDC). Specific acknowledgement of the NCDC staff is made to Mr. J. D. Elms, project leader; Messrs. C. N. Williams Jr. and R. G. Baldwin, and Ms. P. L. Franks for data processing and digital graphics; Mr. M. J. Changery and Dr. W. J. Koss for technical review; Messrs. M. G. Burgin, J. L. Thomas and S. J. Miller, and Ms. C. L. Herman for their drafting skills.

Geographical and Data Coverage

The series of four volumes covers the Central American Waters from the Gulf Coast of North America to the northern coast of South America. The following figure shows the areas covered by each volume, and how they overlap to provide coverage for the entire region.

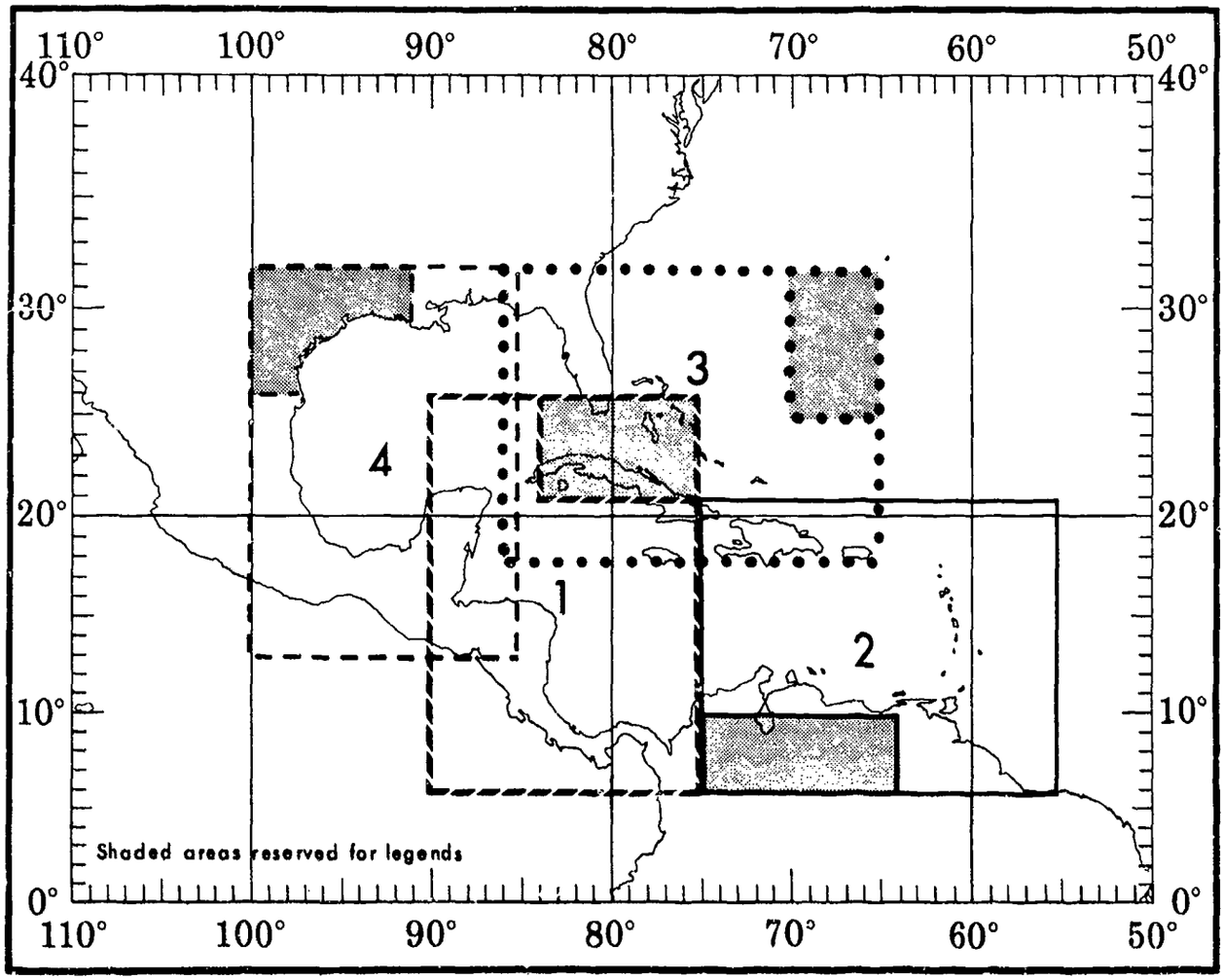


FIG. 1 AREA COVERAGE OF VOLUMES 1—4

This volume, "Florida Coastal Waters and Southwest Atlantic," covers Region 3 as outlined on the above map (Fig. 1). It covers the waters from the southeastern United States to just southwest of Bermuda and south to the Greater Antilles (18°N to 32°N; 65°W to 86°W).

Greatest effort and detail were given to the charts and analyses of the marine areas. Surface marine statistics are presented on monthly charts in the form of graphs, tables, and isopleth maps. Land station data appear mostly as graphical presentations within the text. A significant problem when trying to define the climate over many of the areas of Central and South America is the lack of data. Political instability and changing economic conditions create periods when little observational data are collected, and for many regions where data does exist it is often fragmented, and neither summarized nor published. For some regions data collected only by the European colonialists are available.

subjectively analyzed. Graphs and tables of marine area data (e.g., [illegible] heights, and wind roses) are also presented by one-degree quadrangle. The graphs and tables represent the objective compilation of available data. Those data were not adjusted for suspected biases (low observation count, heavy weighting of observations taken during a short time interval, biases in coding of observations from various source decks, etc.), hence differences may be found when comparing the graphical data with the isopleth analyses. The total number of observations for a given one-degree square should always be considered when interpreting the data because there may not be a sufficient number to permit climatically representative statistics.

Nearly two million five hundred thousand surface marine observations were used in the computation of the statistics for this volume, and over six million for the total region (4 volume set). Those data, taken from NCDC's Tape Data Family-11 (TDF-11), were collected by ships of various registry from as early as 1854 to 1983, with the bulk of the observations being collected in the last 30 years. This is significant because the more recent observations contain more elements than pre-1948 reports. Observation density is greatest along the major shipping routes. In this study area most ship traffic moves north-south passing through the Mona Passage (between Puerto Rico and Hispaniola) or the Windward Passage (between Hispaniola and Cuba) during passage between the Panama Canal and the eastern seaboard of the United States or European ports.

Sea-surface current information was extracted from the Naval Oceanographic Office Special Publications 1400-NA9 Surface Currents Southwest North Atlantic Ocean Including the Gulf of Mexico and Caribbean Sea and 1400 - NA6 Surface Currents West Central North Atlantic Ocean Including East Coast of the United States.

Physical Features

Four major physical-geographical regions are found within the four-volume study area: the mountains (highlands) of Central America and northwest South America, the tropical savanna of eastern Mexico and Pacific Coast of Central America, the humid subtropical lowlands across the southern United States, and the tropical rainforest along the southeastern Atlantic Coast of Central America and on the windward (eastern) side of most of the West Indies Islands.

Low-lying coastal plains cover a rather wide expanse across the southern United States. Elevations remain below 600 feet for some 150 to 200 miles inland before reaching the foothills of the Appalachians in northern Alabama and Georgia, the Ouachita Mountains of Oklahoma and Arkansas, or the Edwards Plateau in Texas. A much narrower coastal plain extends down the east coast of Mexico and it is a relatively short distance inland before the rapidly rising escarpment of the Sierra Madre Oriental Mountains is encountered. Atop this range is a relatively flat plateau extending a major portion of the length of Mexico with mountain peaks reaching 18,000 feet across its southern end. Similar elevation changes and narrow coastal plain occur along the west coast of Mexico where the Sierra Madre Occidental mountain range borders the plateau (reference Topographic Chart, Fig. 2, and geographical locator chart Fig. 3). A rather abrupt break in the mountain range occurs at the southern end of the Bay of Campeche which provides a narrow passage between the Atlantic and Pacific (known as the Istmo de Tehuantepec). Similar breaks occur in southern Nicaragua and across Panama. From the Istmo de Tehuantepec a rather broad coastal plain extends across the Yucatan Peninsula and along the Atlantic Coast of Honduras and Nicaragua. Rugged mountains again rise along the west coast with heights reaching above 13,000 feet in Guatemala and 11,000 feet in Costa Rica.

Two chains of active volcanic ridges extend along major earthquake faults; one chain runs up the Lesser Antilles Island group and the second up the west side of Central America from Colombia to southern Mexico. Scattered throughout the West Indies are numerous islands with the majority falling along the major fault line; this creates the semblance of a stepping-stone pattern from Florida to Venezuela. The larger islands in the group (Cuba, Hispaniola, Jamaica, and Puerto Rico) form the Greater Antilles, and the smaller islands (Virgin Is., Windward Is., Leeward Is., and the islands in the southern Caribbean north of Venezuela) extending south from Puerto Rico to South America, the Lesser Antilles. The Bahama Islands, which lie to the southeast of Florida and north of Cuba, are the third and final major group making up the West Indies.

The highest elevations in the West Indies are found on Hispaniola where peaks reach above 10,000 feet. Peaks as high as 7,000 feet are located on Jamaica with elevations reaching 6,000 feet in southern Cuba. Four-thousand foot peaks occur on Puerto Rico and a few of the smaller islands. Much lower peaks are found on the remaining islands.

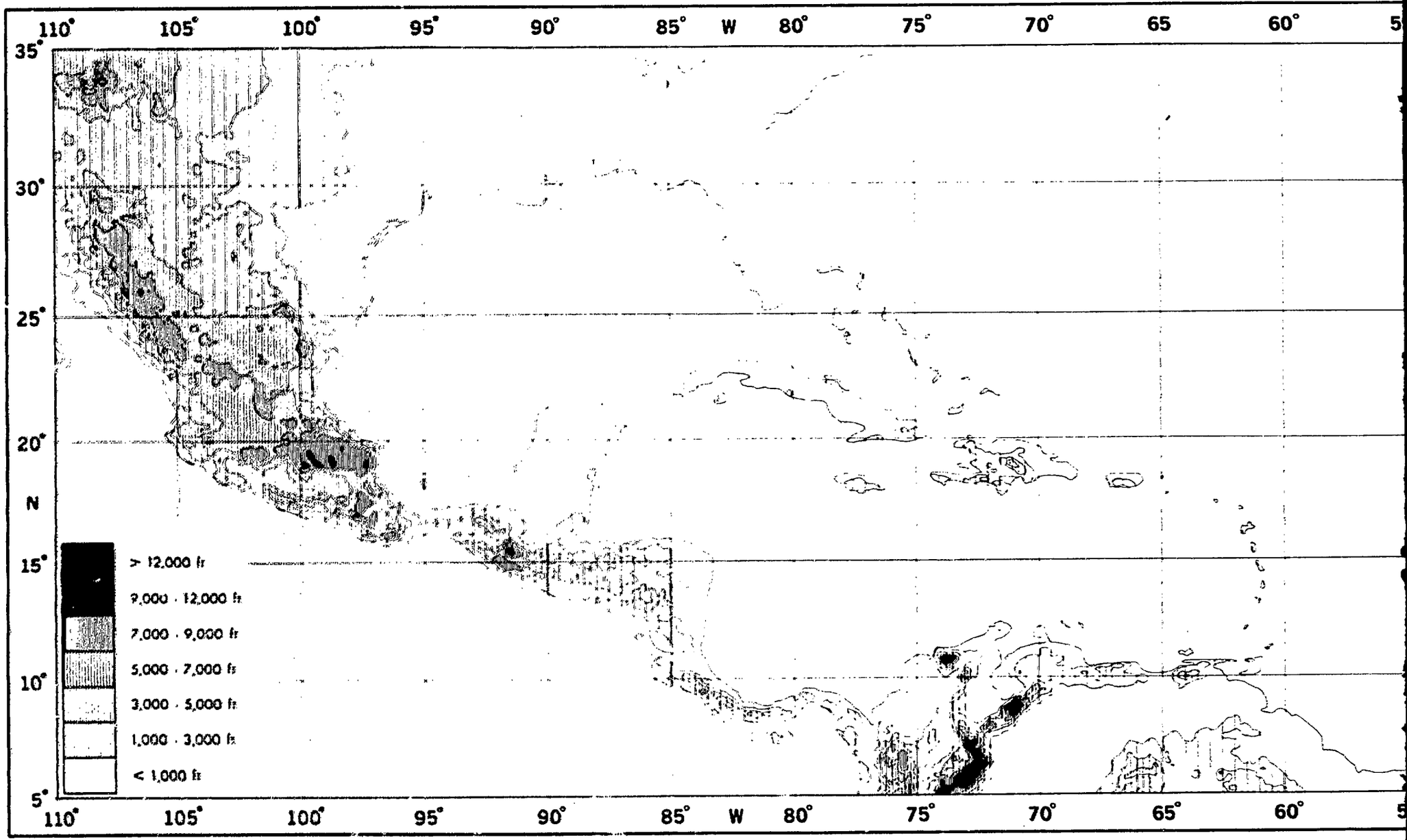


FIG. 2 TOPOGRAPHICAL CHART

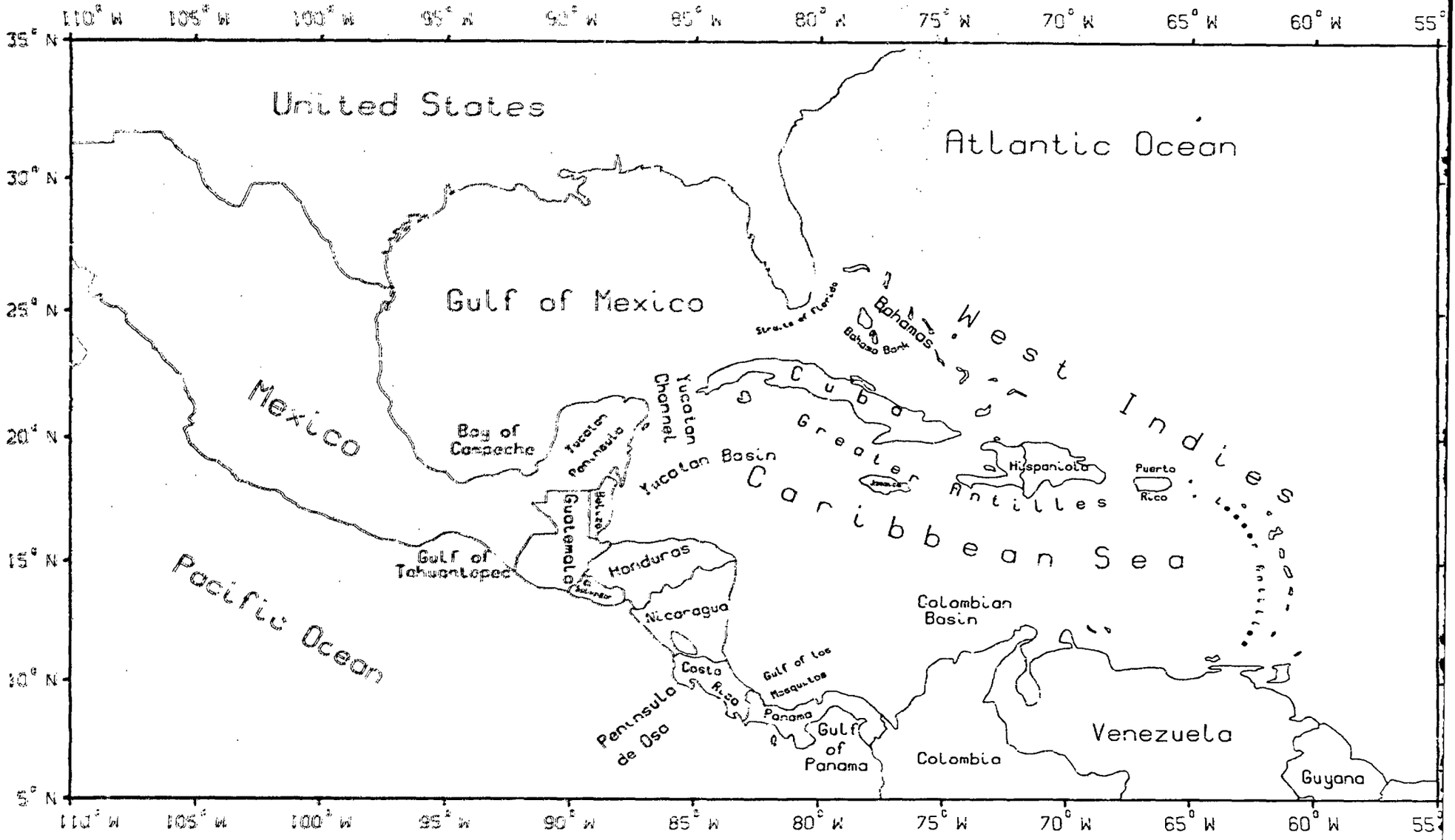


FIG. 3 GEOGRAPHICAL LOCATOR CHART

along the U.S. Gulf Coast narrowing somewhat near the Alabama-Florida state line but then broadening out again until reaching northern Mexico. A rather narrow continental shelf extends down along the east coast of Mexico before widening out significantly along the northwest coast of the Yucatan Peninsula. Another broad shelf area extends from northeast Honduras eastward towards Jamaica. Other broad continental shelf areas include the Bahama Bank, northeast coastal region of South America, and a few smaller areas along the west coast of Cuba. Along the Pacific Coast of Central America a narrow continental shelf runs the full length of the coast except for the Gulf of Panama.

Depths of over 12,000 feet are found in only a few regions of the Gulf of Mexico, but they are rather common in the Caribbean basin. Bathymetry surveys have shown depths of over 20,000 feet in the Cayman Trench south of the Cayman Islands, and over 25,000 feet, the deepest in the Central American Waters, in the Puerto Rico Trench which lies north of the island.

Climate

The northern portions of the Central American Waters lie in the subtropics while southern sections lie within the tropics. This generally means that the Caribbean Sea is under the influence of the easterly trade winds, and the northern part of the Gulf of Mexico the mid-latitude westerlies. Although most parts of the region will feel the effects of both tropical and subtropical conditions, an ill-defined zone exists between the two that is subject to both influences. During the winter, cold air occasionally pushes deep into the Gulf of Mexico with westerly winds often being observed as far south as the southern end of the Mexican Plateau. However, their appearance this far south is often related more to altitude than to latitude. The structure of the trade winds is generally rather shallow with the easterlies normally giving way to the upper westerlies (antitrades) above 3,000 feet.

The general circulation over the area is controlled mostly by the North Atlantic subtropical high, which is commonly known as the Azores or Bermuda high (Fig. 5). Flow along its southern edge produces the large scale northeastern flow known as the trades, the most globally consistent winds for directional constancy. Trade winds are at their weakest during the winter, the dry season, and their strongest during the summer, the wet season. The trades do not generally contain a deep moist layer because of an inversion that usually appears at 3,000 to 5,000 feet above mean sea level. Below this inversion it is quite moist whereas above the inversion it is relatively dry and cloudless. An almost mirror image of the trade wind inversion appears between the northern and southern hemispheres. Equatorward of 15° latitude the inversion rises both westward and equatorward to heights of over 6,000 feet, encircling the equatorial trough. Termination of the trade wind inversion usually takes place in the middle latitudes and variations in the inversion for given locations have proven significant between individual observations (Riehl, 1979). Within the equatorial trough zone and over western portions of the trades the inversion often disappears and it is not considered to be a mean condition. Broad scale subsidence of air within the subtropical high establishes the trade wind inversion. The greatest descent of air takes place across the high's southeastern quadrant which causes the inversion to be generally lower and stronger over the eastern portions of the ocean.

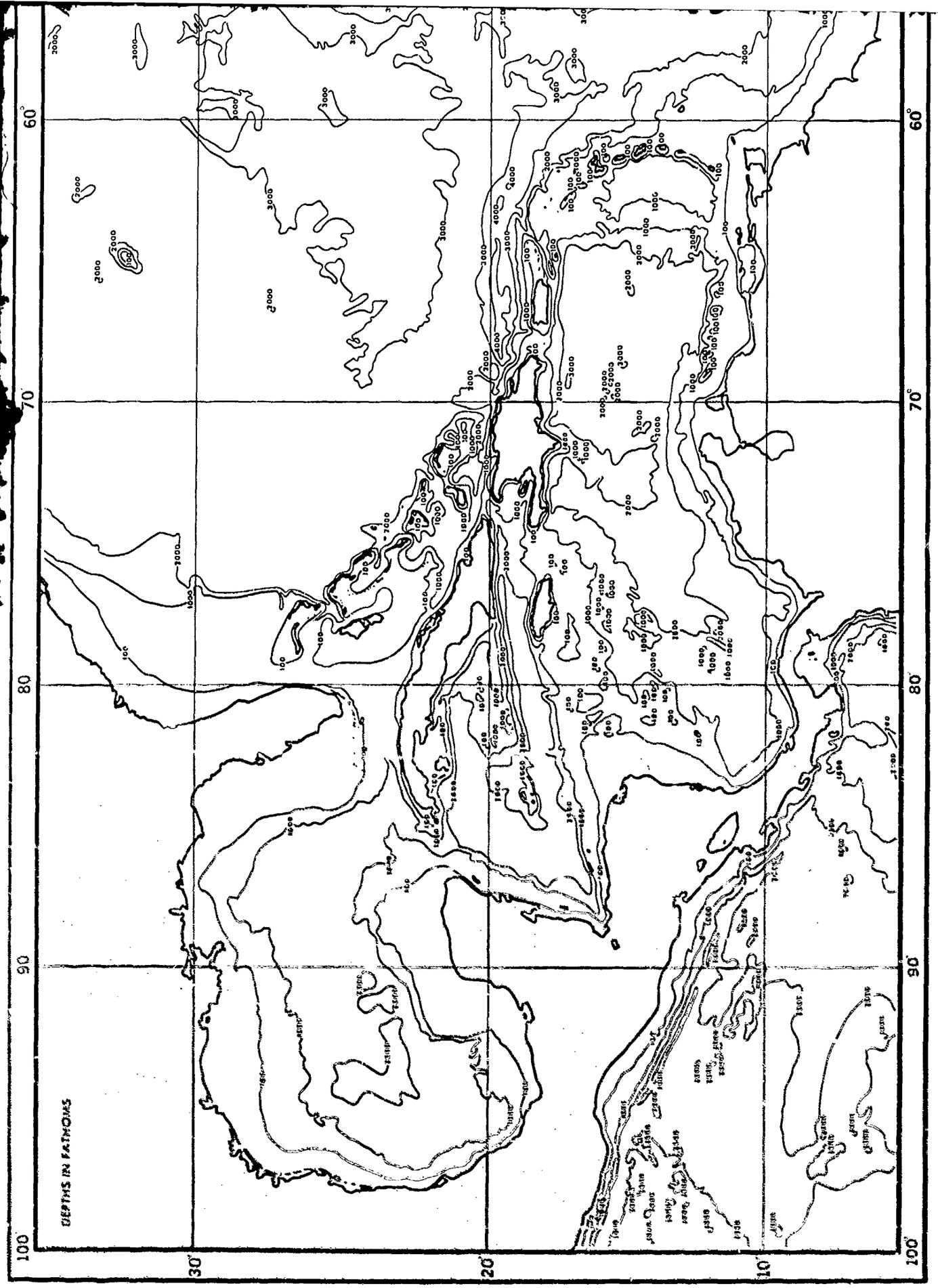
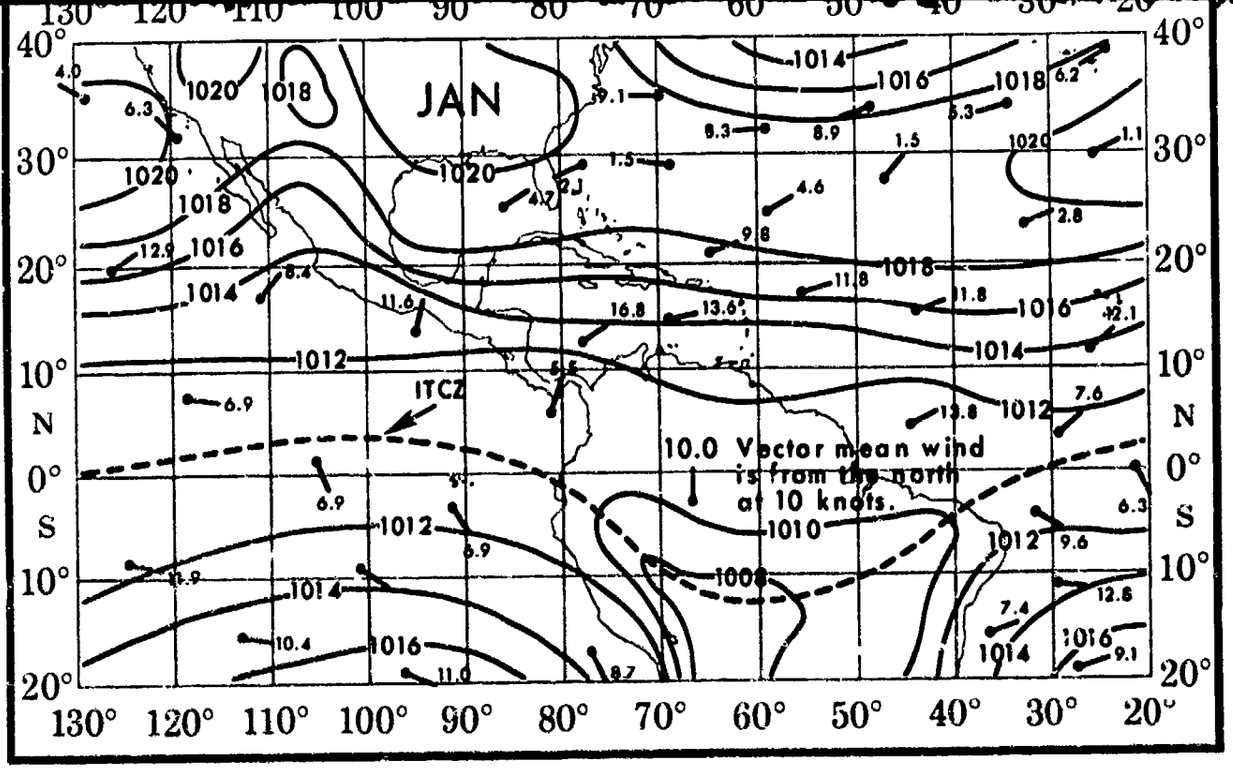


FIG. 4 BATHYMETRY CHART



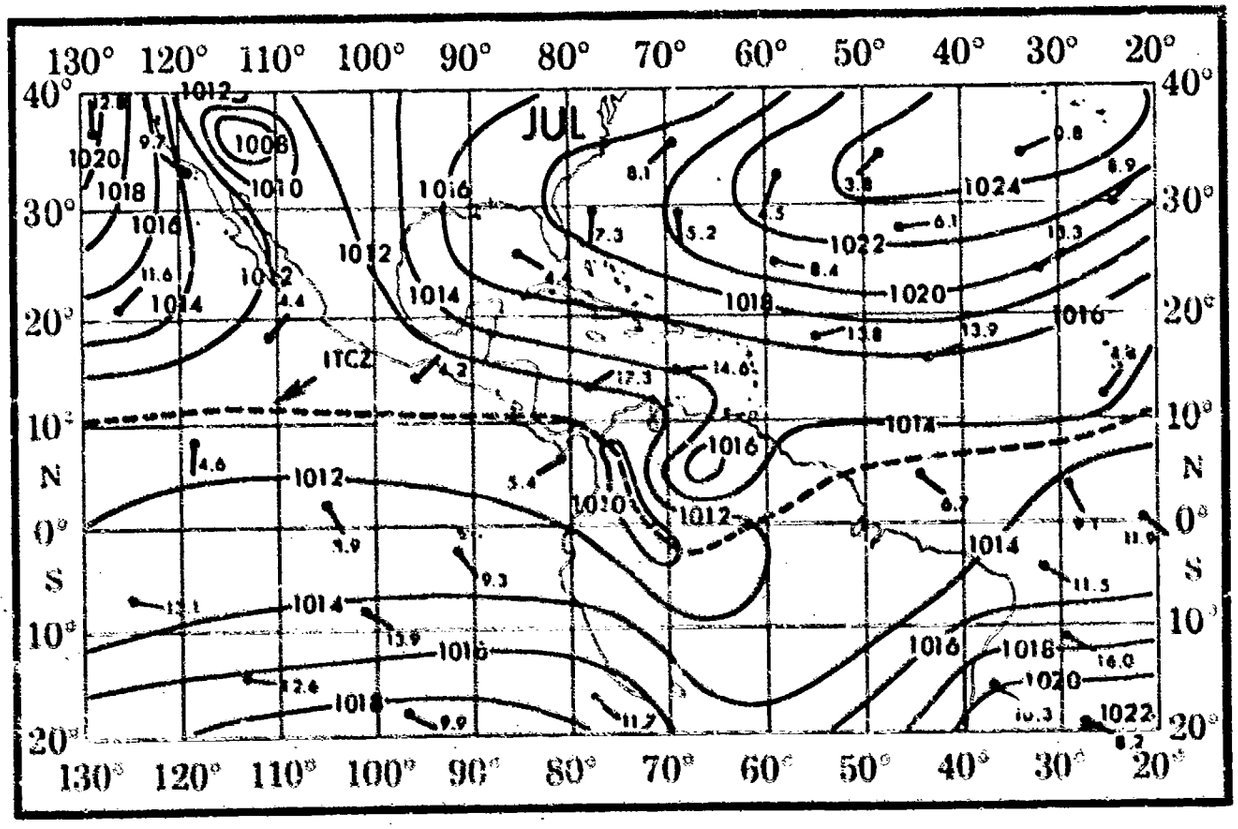


FIG. 5 MEAN EQUATORIAL TROUGH AND VECTOR MEAN WINDS

such as the equatorial trough, trade wind trough, intertropical front, equatorial front, cyclonic directional shear zone, etc. It was originally described as the dividing line between the northeast and southeast trades. Continued research has shown this system to be complex, because it is not necessary for the equatorial trough, the wind convergence zone and maximum cloudiness to coincide. Godshall (1968) showed that a displacement exists between the maximum cloud cover areas and the convergence zone centers and that some of the displacements are quite large. Water vapor transferred from the sea to the atmosphere becomes trapped below the trade inversion and is thus transported to the ITCZ by the trade winds themselves (Augstein, 1976). A good schematic of this process, adapted from Augstein (1976), is shown in Figure 6.

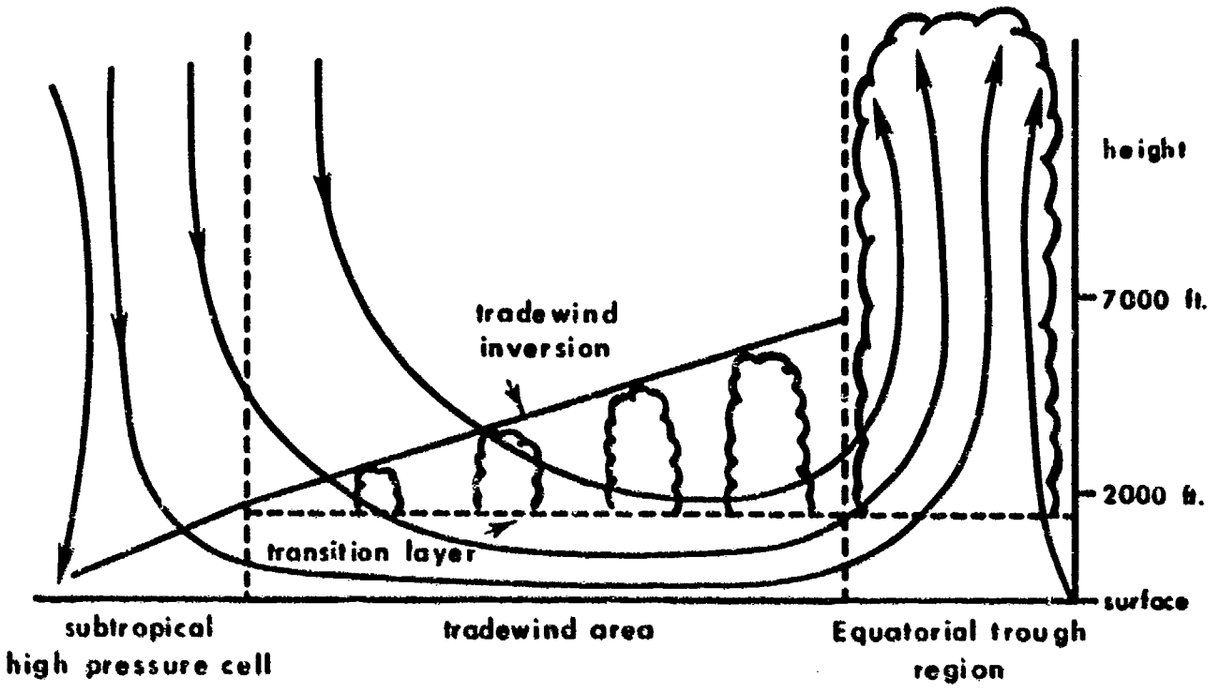


FIG. 6 EQUATORIAL TROUGH/TRADE WIND SCHEMATIC

Movement of the ITCZ, northward and southward, is in harmony with the sun's movement and the resultant strengthening and weakening of the subtropical highs. Studies have shown that the global seasonal progression has its smallest annual displacement between approximately 40°W and 160°W (Riehl, 1979; Balek, 1983) which results in the equatorial trough barely pushing into the Caribbean region even during its most northern extent. During the wet season the equatorial trough tends to lie northwest-southeast across southern Central America (see Fig. 5) affecting the eastern Pacific most significantly.

Continuous change is associated with the ITCZ, from periods with locally heavy downpours to those with clear skies. Large displacements of the zone itself are often observed. Typically there are regions experiencing heavy convective activity while others in close proximity are experiencing no significant weather. An example of such conditions within the ITCZ is seen in Figure 7 (NASA, 1977) where a continuous band of clouds appears over the eastern Pacific while some relatively clear areas appear over the Atlantic.

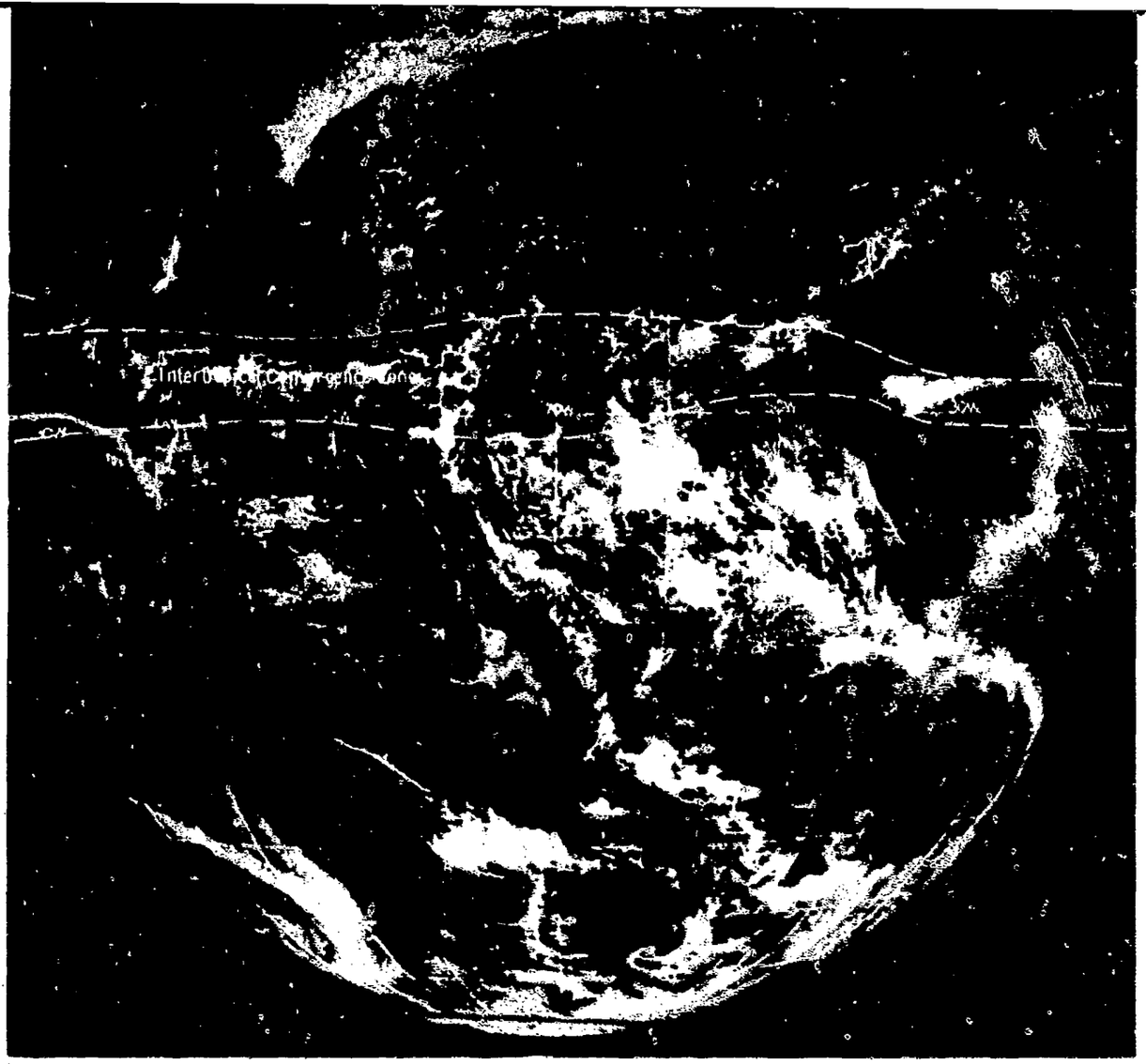


FIG. 7 SATELLITE SYNOPTIC IMAGE (JANUARY 3, 1974, 12:20 GMT)

Two distinct precipitation seasons are typical for most regions of the Central American Waters. An exception is along the Gulf Coast of the United States where four distinct seasons associated with the middle latitudes prevail. Interannthly precipitation averages differ little throughout the Gulf Coast region. A small maximum is noted in July and a minimum in October. For the large remaining portion of the study area, basically only wet and dry seasons are discernible. The wet season normally runs from May through November with the dry season covering the remaining months. Because the sun's position changes little in the tropics the temperature cycle is typically stable with little annual variation. Expected temperatures are usually of little concern, therefore, the important question is whether the rains will come as expected, for they spell success or failure of the crops. Normal rainfall depends on the major circulation patterns coming into play as the North Atlantic subtropical high builds during the summer season. With its development, easterly winds become stronger aloft transporting increased moisture necessary for the seasonal rains. Orographic effects play an increasingly important role along with convergence and surface heating, as any one of these can trigger the instability necessary for producing rain showers and thunderstorms. As the North Atlantic subtropical high weakens during the winter (see Fig. 5) the westerlies again dominate the flow aloft, cut off the moist easterly flow, and thus bring on the dry season.

These cool surges of air are referred to as northers and generally bring stronger-than-normal winds and below-normal temperatures as far south as Panama and the southern Caribbean. Northers are modified rather quickly by the tropical environment, thus they affect an area for only one to two days.

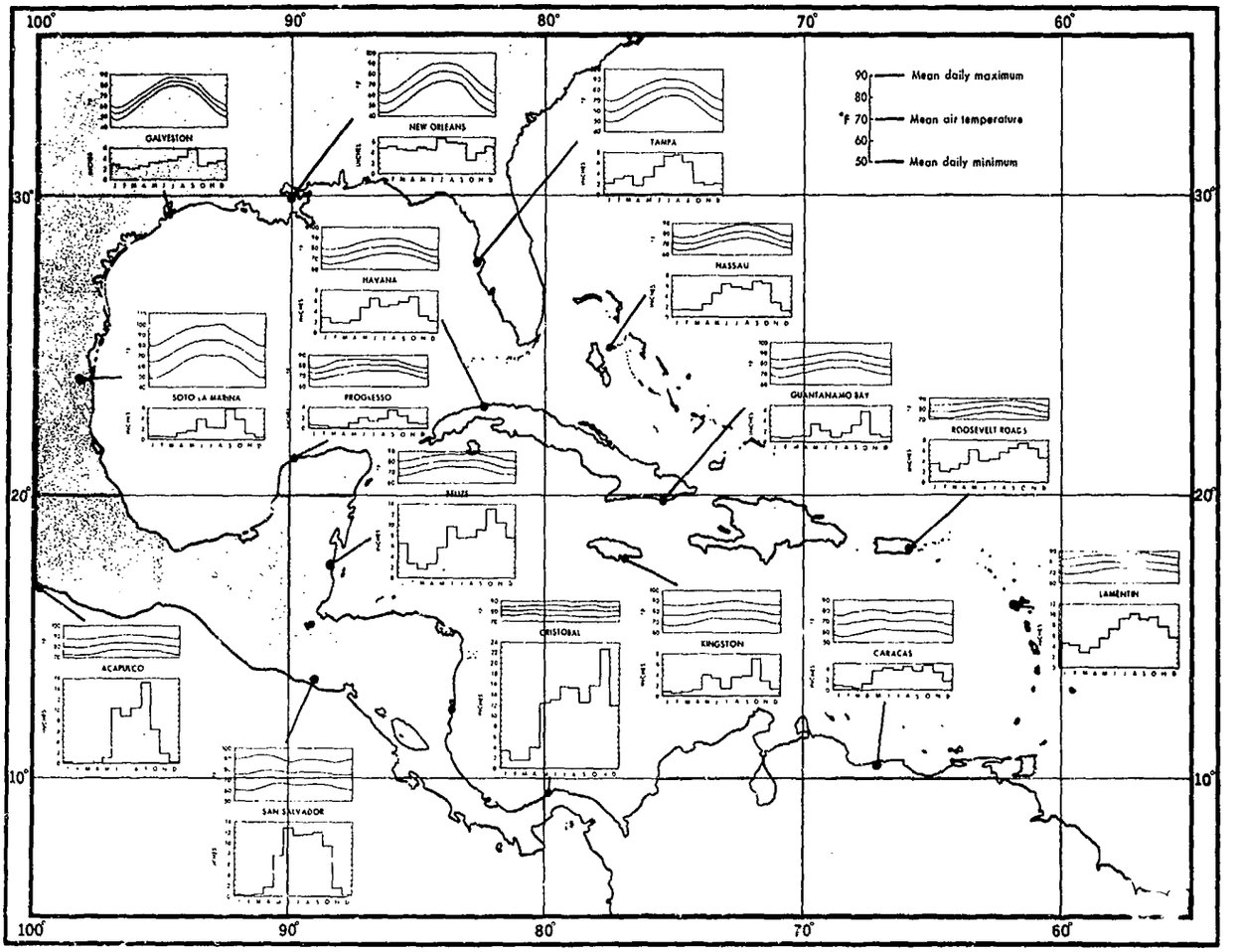


FIG. 8 MONTHLY MEANS OF AIR TEMPERATURE AND RAINFALL

25°F–30°F along the Gulf Coast of the U.S. and 10°F or less for most regions south of 20°N. Exceptions south of 20°N are found at some of the higher peaks and across most of Mexico north of 16°N and west of 92°W, except for along the Pacific Coast. Diurnal temperature ranges within the tropics are much greater than the monthly mean temperature differences between the warmest and coldest months. Cloudiness is an important factor because it restricts the afternoon maximum temperatures during the rainy season, whereas, the lack of cloud cover during the dry season permits more nighttime cooling resulting in lower minimum temperatures. Northern Mexico and the southern coastal plains of the U.S. experience wintertime mean temperatures of 55°F to 60°F with average summer temperatures increasing to 80°F to 85°F. These summer values are similar in magnitude to those reported in the lower latitudes where seasonal variations are small. The mean freezing level over the Caribbean remains fairly constant throughout the year at 15,000 to 16,000 feet. While freezing level heights remain at these levels over the southern U.S. during the summer, they drop to near 12,000 feet during the winter. Annual variations in the mean tropopause height are also small; the tropopause height ranges from 45,000 to 50,000 feet across the entire study area.

Tropical cyclones are the most feared and devastating weather phenomena of the region. Annual frequencies of these storms vary widely among years. For the period 1871 through 1985, for which there are reasonably good records in the North Atlantic, the least activity occurred in 1890 and 1914 when only one tropical storm was reported. The most active years were 1933, when 21 tropical cyclones reached tropical storm strength (34 knots or greater), and 1969 when 12 reached hurricane strength (64 knots or greater). In the North Atlantic Basin, the main tropical cyclone season runs from August through October with significant occurrences in June, July, and November. April is the only month in which no tropical cyclone has ever been reported within the North Atlantic basin.

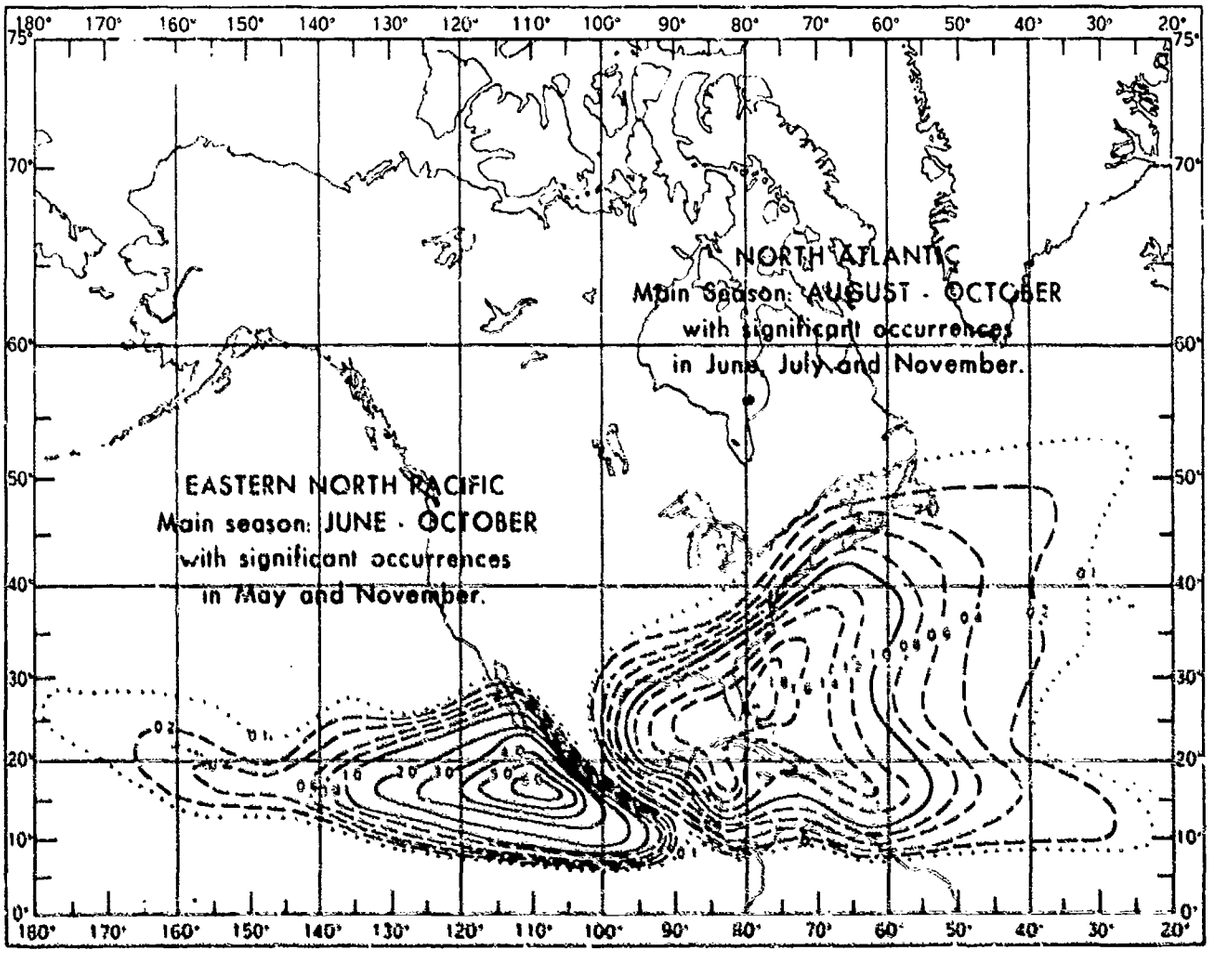


FIG. 9 AVERAGE NUMBER OF TROPICAL CYCLONES PER 5° SQUARE PER YEAR

west-to-northwestward out to sea with few affecting Central America. The average number of tropical cyclones per five-degree square per year is given in Figure 9 and the annual 12-hourly movements by five-degree square of tropical cyclone centers with tropical storm intensity or greater are shown in Figure 10. Both figures were adapted from Crutcher and Quayle (1974), a major work produced for the U.S. Navy which presents frequencies and preferred tracks for worldwide tropical cyclones.

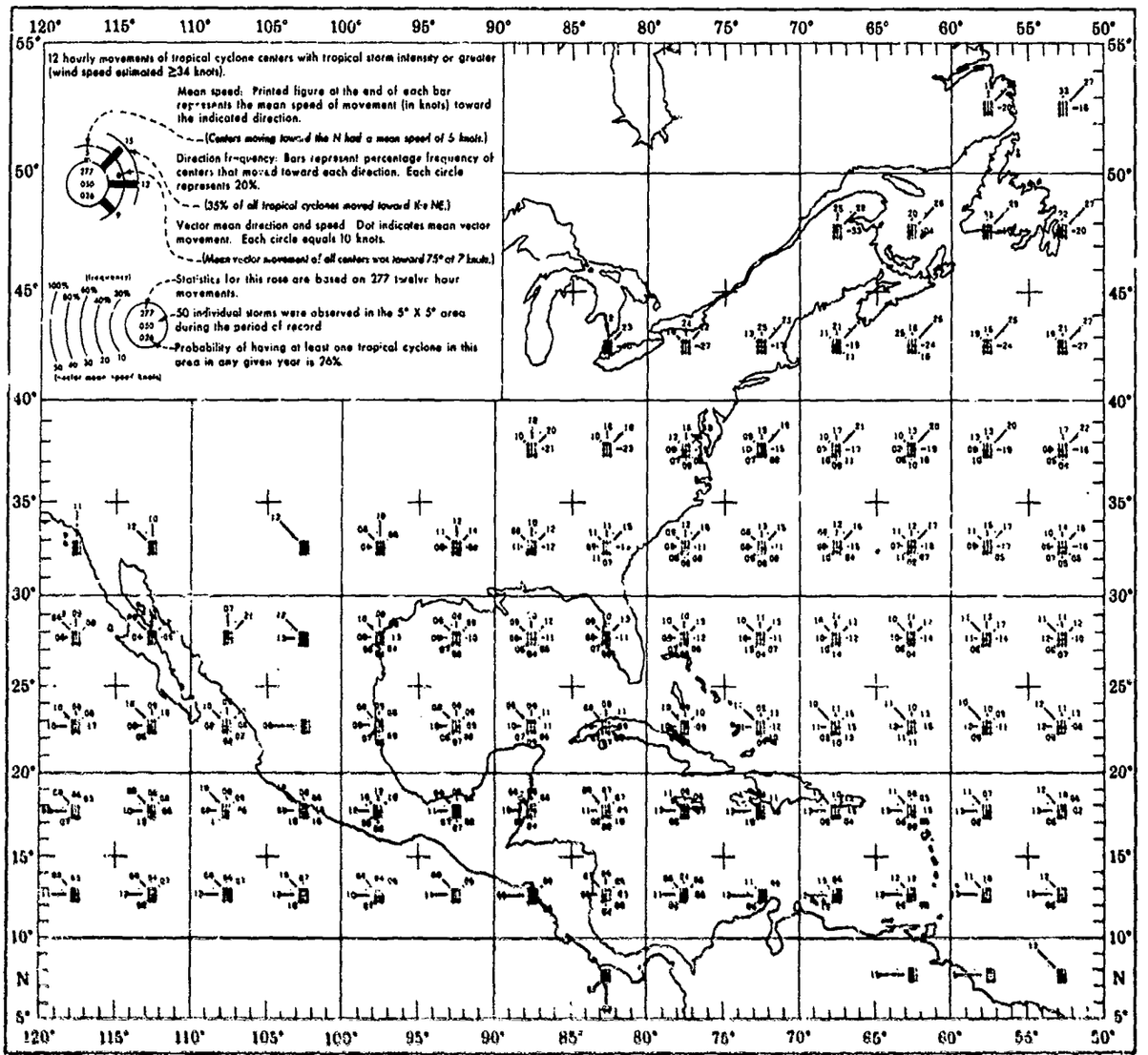


FIG. 10 ANNUAL 12 HOURLY MOVEMENTS OF TROPICAL CYCLONE CENTERS WITH TROPICAL STORM INTENSITY OR GREATER

Precipitation

Of the elements recorded in the marine data base, precipitation is the one most subject to error in both the way it is observed and the way it is interpreted. In many areas of the world, especially in more recent years, it is likely that ships try to avoid foul weather and thus bias the data towards fair weather.

Region 3, as in the other areas of the Caribbean and Gulf of Mexico, experiences a low frequency of precipitation versus sunshine which makes it difficult to establish any seasonal patterns. The percent frequency of present weather observations reporting precipitation is low throughout the year, averaging from one to seven percent. The wetter season occurs during the fall and winter months with the driest period of the year occurring from April through June. The higher frequencies are generally observed to the north and east of Florida, averaging 5 to 7 percent. During April and May frequencies are less than 5 percent throughout Region 3. This region is affected more by mid-latitude weather systems crossing the North American Continent than either regions 1 or 2 and, therefore, higher precipitation frequencies are observed during the winter season at the higher latitudes. The lower latitude regions remain drier during the winter months which is similar to the seasonal precipitation cycle of other areas in the Gulf and Caribbean.

Assessing oceanic rainfall data is a major problem because transit ships are unable to take quantitative precipitation measurements. A number of studies have been conducted in efforts to predict precipitation amounts or rates of fall based on estimates derived from the use of present weather observations from ships of opportunity (Goroch, et al., 1984) and readings from satellites (Rao, et al., 1976).

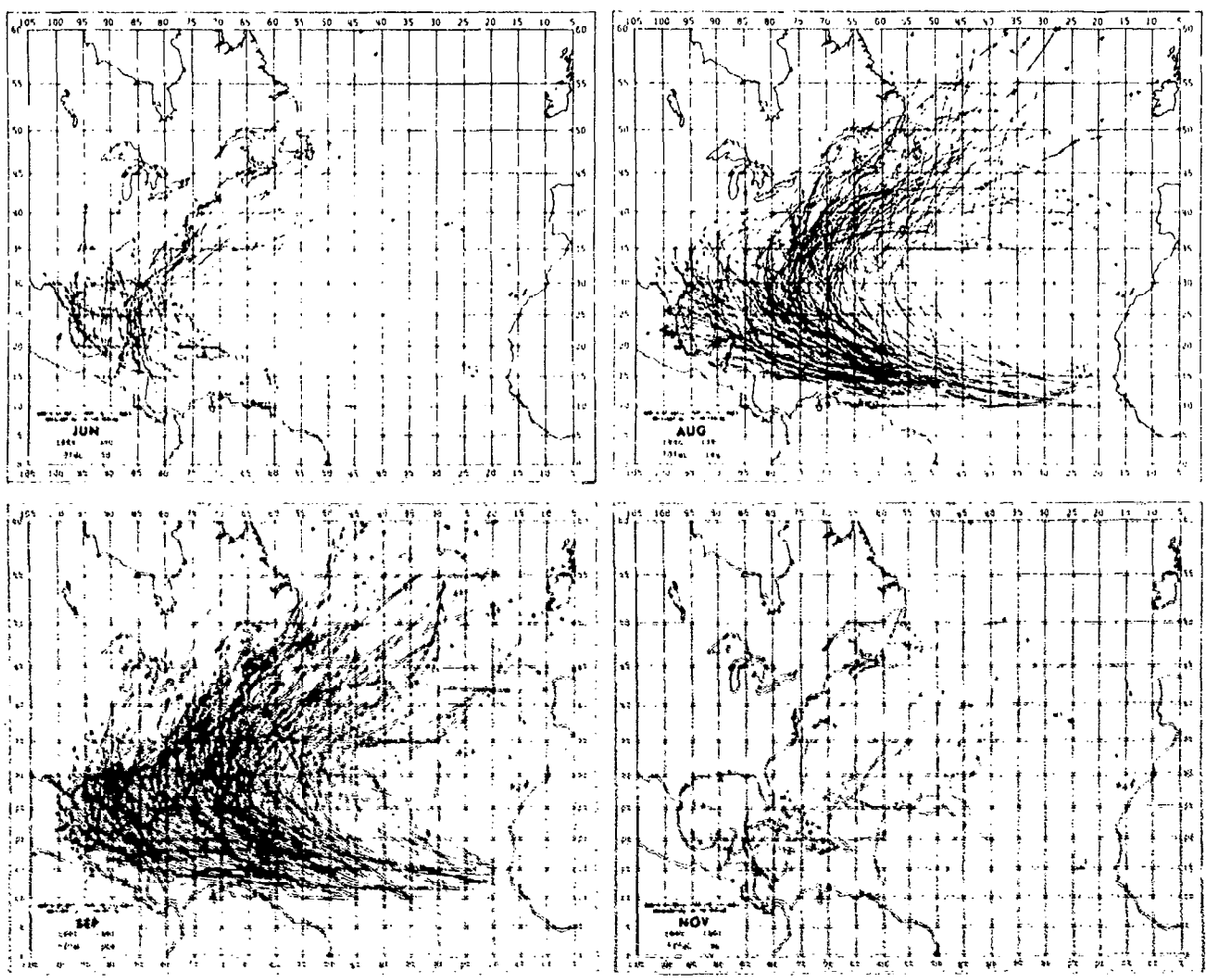


FIG. 11 TROPICAL CYCLONE TRACKS (JUN, AUG, SEP, AND NOV)

hurricane season (May and June) occurs in the western Atlantic (Caribbean Sea and Gulf of Mexico). Later in the season (July through September) more development occurs in the central and eastern sections, and the season finale (October and November) distribution is more evenly divided between the eastern and western halves of the tropical Atlantic. To illustrate how storm development shifts with the season, tropical cyclone tracks for storms originating in June, August, September, and November (1886-1980) are presented in Figure 11.

By referring back to Figure 10, inference can be made on preferred tracks for the region along with the annual probabilities of encountering a storm. From Figure 9 one can see that for Region 3, the chance of encountering a tropical storm increases the most off the east coast of Florida.

Air Temperature

Air temperature is one of the elements most frequently observed by mariners. On many ships the heating effect of the ship's structure has a tendency to produce higher than actual ambient air temperature readings because of instrument exposure. This is especially true in the tropics where sunny, calm days are numerous.

From October to June the mean air temperature pattern is basically zonal. The winter season brings a much stronger temperature gradient than the summer season with temperatures off the Florida coast averaging some 20 to 25°F lower in the winter than the summer, while at 20°N, the differences are less than 5 to 6°F. From March to October the air temperature pattern off the east coast of Florida takes on the characteristics of the sea temperature pattern due to the effects of the Gulf Stream. This pattern is especially strong from April through September with the overall pattern becoming much more meridional in July and August. Near 20°N, mean air temperatures range from 78°F to 84°F throughout the year while near 30°N they range from the high 50's to the low 80's.

Sea Surface-Temperature

Sea-surface temperatures are recorded with a fairly high frequency in marine observations. The principle methods for sampling are intake thermometers and buckets. Even though the two methods can produce slightly different results, the data can be used with considerable confidence.

The Gulf Stream strongly influences the sea surface temperature pattern across Region 3 throughout the year. The greatest influence is off the east coast of Florida where the central core of the Gulf Stream produces mean sea surface temperatures ranging from a high of 85°F during August to a low of 76°F during the period January through March. At 30°N, mean sea surface temperatures during February range from 64°F off the Florida coast to 75°F at 79°W (central core of the Gulf Stream) to just over 69°F at 70°W. At 20°N, February sea temperatures range from 78°F to 79°F at all longitudes. During August, mean sea temperatures range from 81°F to 85°F across the entire region with the 85°F temperatures occurring west of Florida and along the central Gulf Stream position east of Florida. The coolest mean values are found along the Northeast Florida coast.

Surface Winds

Surface wind is one of the most commonly observed elements. Many of the observations from the NCDC data base are visual observations based on the roughness of the sea. In recent years more ships acquired anemometers and reported measured winds. Prior to 1963 many of the wind speeds were recorded in the Beaufort scale; such estimates have proven to be quite reliable and can be used with a high degree of confidence. Five sets of wind speed isopleths are presented: the mean speed, and the percent frequency of winds less than 11 knots, from 11 to 21 knots, from 22 to 33 knots, and greater than or equal to 34 knots. Also included are wind roses, for one-degree squares.

Fig. 5). During the winter, mean wind speeds generally range from 12 to 14 knots in the vicinity of Cuba and Hispaniola, 15 to 17 knots east-northeast of the Florida continental shelf, and 10 to 12 knots along the Florida coast. Mean wind speeds generally decrease by 2 to 5 knots during the summer, except for the area just north of Hispaniola where they increase by a knot.

Gale force winds ($\geq$ 34 knots) are observed less than 1 percent of the time from May through August throughout Region 3, even though it is part of the hurricane season. Frequencies increase to over 5 percent during January and February across the northeastern sections of Region 3. Gale frequencies of one percent appear, in a few areas, at the lower latitudes during the peak of the hurricane season (September and October); however, most are observed at the higher latitudes during the winter season when westerlies and cold continental outbreaks affect the northern edge of the Gulf of Mexico and the North Atlantic waters east of Florida.

The percent frequencies of wind speeds less than 11 knots are 40 to 50 percent along the Greater Antilles, 30 percent east of northern Florida, and as high as 60 percent along the west coast of Florida during the winter. By late summer and early fall these low wind speeds average 50 to 70 percent across most areas of Region 3. Somewhat higher frequencies of winds less than 11 knots are observed in the protected coastal waters of western Haiti.

From November through April 40 to 50 percent of the observed winds across Region 3 are between 11 and 21 knots. By July, frequencies range from less than 20 percent, off western Florida, to over 70 percent north of Hispaniola. Well over 90 percent of the observed winds during the summer fall below 22 knots, and just under 80 percent during the winter.

During winter, speeds of 22 to 33 knots are observed as much as 20 percent of the time along the northeastern edge of Region 3 and then generally less than 10 percent at latitudes south of 25°N. From May through August, only a few areas across Region 3 observe frequencies of 5 percent or better. By September, a few small areas begin to experience average wind speeds of 22 to 33 knots at frequencies of 10 percent or higher. The annual cycle then continues with the higher frequencies occurring in the winter and the lower ones during the summer.

Visibility

Visibilities are difficult to measure at sea because of the lack of distance reference points. Climatically, many low visibility observations are probably missed because the observer is too busy with other duties (fair weather bias). However, the coarseness of the visibility code intervals tends to minimize the problem thereby permitting the summarized data to be relatively consistent.

Visibility tables, as in previous volumes, are presented by one-degree quadrangle. It is clear from the tables that visibilities are generally good throughout Region 3 averaging five nautical miles or better at least 90 percent of the time regardless of the month. Visibility of 10 miles or better averages 80 to 90 percent, while low visibilities (less than one mile) occur less than 0.5 percent of the time.

Clouds

A survey of the cloud data (total and low cloud amounts) from the marine data base shows a number of total cloud reports significantly greater than low cloud amounts. This is because many of the early marine observations contain only total cloud amounts. For the two presentations (total cloud amount $\leq$ 2/8 and low cloud amounts $\geq$ 5/8) only those observations reporting both total and low cloud amounts were summarized. This helps eliminate problems introduced as a result of different size data bases (N-count). The use of satellite data helps bolster confidence in the total cloud analyses because they show fairly close agreement with those analyses (U. S. Department of Commerce and United States Air Force, 1971).

During the cooler half of the year (November through April) the percent frequency of total clouds less than or equal to two eighths average 20 to 30 percent over the North Atlantic east of Florida and 40 to 50 percent south of 25°N. For the remaining months it averages near 30 percent throughout Region 3 regardless of the latitude. There are a few instances in relatively small areas where the percentage will fall below 20 percent or above 40 during the warmer season.

Puerto Rico the frequencies drop to 20 to 30 percent during this period. Frequencies of low cloud ceilings begin to decrease over the next several months reaching a low from June through August where frequencies are observed near 20 percent throughout the study area.

Ceiling and Visibility

Aircraft-type ceilings are not available from marine observations. The ceilings are estimated from the height of the lowest cloud when low clouds cover more than half the sky. When the sky is totally obscured by rain, fog, dust, or other phenomena, the total obscuration is considered a ceiling with a height of zero. Mid-range ceiling and visibility charts (ceiling less than 1,000 feet and/or visibility less than 5 nautical miles; ceiling less than 8,000 feet and/or visibility less than 10 nautical miles) and low range ceiling and visibility charts (ceilings less than 300 feet and/or visibility less than 1 nautical mile; ceiling less than 600 feet and/or visibility less than 2 nautical miles) are presented.

Ceilings less than 8000 feet and/or visibilities less than 10 nautical miles are generally observed 20 to 30 percent of the time throughout the year south of 25°N. North of this latitude, values average near 40 to 50 percent from November to April and from near 30 to occasionally 40 percent for the remaining months.

Ceiling less than 1000 feet and/or visibility less than 5 nautical miles (the next lower threshold) averages near 10 percent from September through December and mostly between 5 and 10 percent from March to September. During January and February frequencies reach averages of just over 15 percent in the Northeast section of Region 3 with frequencies of less than 10 percent for most areas south of 25°N.

Conditions rarely deteriorate into the lowest threshold category (less than 300 feet and/or 1 nautical mile). The highest frequencies for this low category are observed along the Florida coast during winter with frequencies reaching just over 3 percent. For the remainder of the year, frequencies average one percent or less. For ceiling less than 600 feet and/or visibilities less than two nautical miles, frequencies run as high as 8 percent along the Gulf Coast of the Florida panhandle in February and March, and between two and four percent for the remaining months. For other areas, frequencies usually average 2 to 3 percent throughout the year.

Wave-Heights

Wave-heights have been recorded in a consistent quantitative code only since the late 1940's. The reluctance of many observers to take wave observations in the earlier years and the difficulty in estimating waves, especially in confused seas, make wave observations one of the least commonly observed elements. They are also subject to biases. Generally the heights are too low, the periods too short, and the sea-swell discrimination poor (Quayle, 1980). The data in this study have not been adjusted for the suspected biases but they were processed through a quality control procedure where an internal check was made between wind speed and sea height. The data were also matrix-arrayed and apparent erroneous outliers were deleted in both the sea and swell data. Wave-height presentations include isopleth maps showing percent frequencies of wave-heights $\geq$ 3 feet and $\geq$ 8 feet. In addition, wave-height tables by one-degree quadrangle show frequencies by six wave-height categories. In these presentations, the higher of the sea or swell was selected for summarization. If heights were equal, the wave with the longer period was selected.

Wave-heights of three feet or higher are observed 60 to 70 percent of the time over the open Atlantic east-northeast of the Bahama Islands during the summer and 80 to 90 percent during the winter. From Florida to Hispaniola frequencies of three foot or higher wave average some 20 to 30 percent less than over the open Atlantic. Wave-heights of eight feet or higher during the winter are 20 to 30 percent over the open Atlantic and 10 percent or less for the coastal waters of Florida and the Islands. During the summer, frequencies for eight foot or higher waves usually average under 10 percent all across Region 3.

were forwarded by the various merchant marines to the Naval Oceanographic Office. From these drift observations, the set (direction) and drift (speed) of the prevailing currents are calculated for each one-degree square. The density of observations is greatest along the major shipping routes and the reliability of the current charts is best in these areas. The data are considered most useful when used collectively as such in summaries where a large number of observations are available.

Surface current charts displayed for Region 3 are Winter (Jan., Feb., Mar.), Spring (Apr., May, Jun.), Summer (Jul., Aug., Sep.) and Autumn (Oct., Nov., Dec.).

Summary

Large variations in the weather are not experienced at scales that exist in the higher latitudes except during the passage of seasonal tropical cyclones and depressions. In general, weather conditions are pleasant with small diurnal temperature ranges and small intermonthly temperature variations. This is especially true for the marine areas. Land site weather can vary much more depending on elevation, local effects, cloud cover, land and sea breeze, and the effects of ocean currents and sea temperatures. In addition to the persistently warm temperatures, high humidities prevail especially over lowlands and ocean areas.

At lower elevations daily temperatures generally range from nighttime lows in the 60°F's to 70°F's to daytime highs of 80°F's and 90°F's. Temperatures at elevations above 10,000 feet will average 10°F to 20°F lower. Below 3,000 feet, extreme temperatures rarely drop below 40°F although they occasionally rise above 100°F.

Hurricanes are certainly the most destructive natural force in the region, and their associated storm surges prove to be the most damaging phenomenon to low-lying coastal areas, because they often rise 10 to 15 feet above normal tide level. Flooding and mudslides also prove dangerous with both usually resulting from a passing hurricane.

Although migratory low pressure systems, such as easterly waves and tropical cyclones, strongly influence the weather from time to time, it is the constancy of the trade winds and high sun angle that establishes the regional climate.

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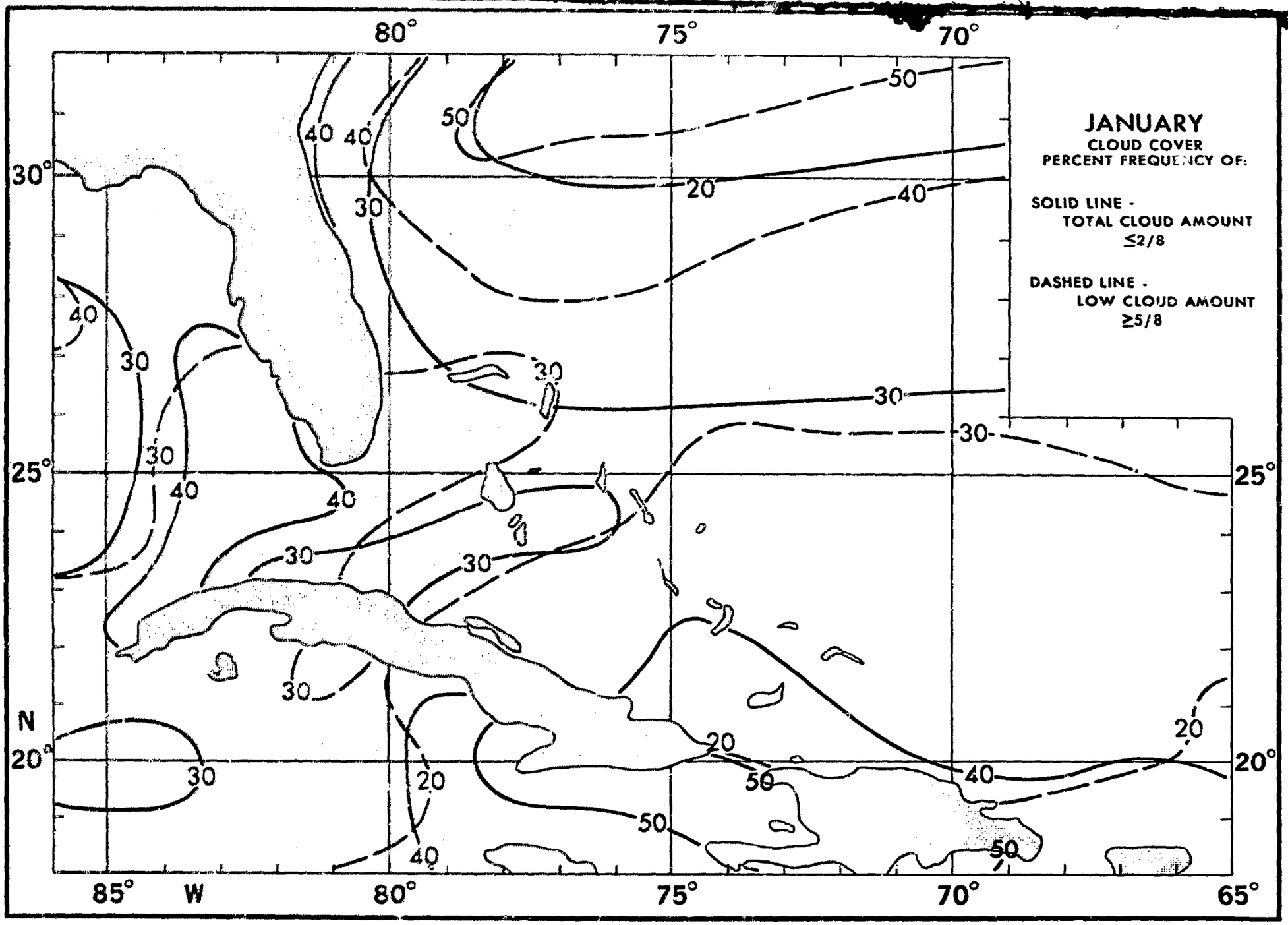
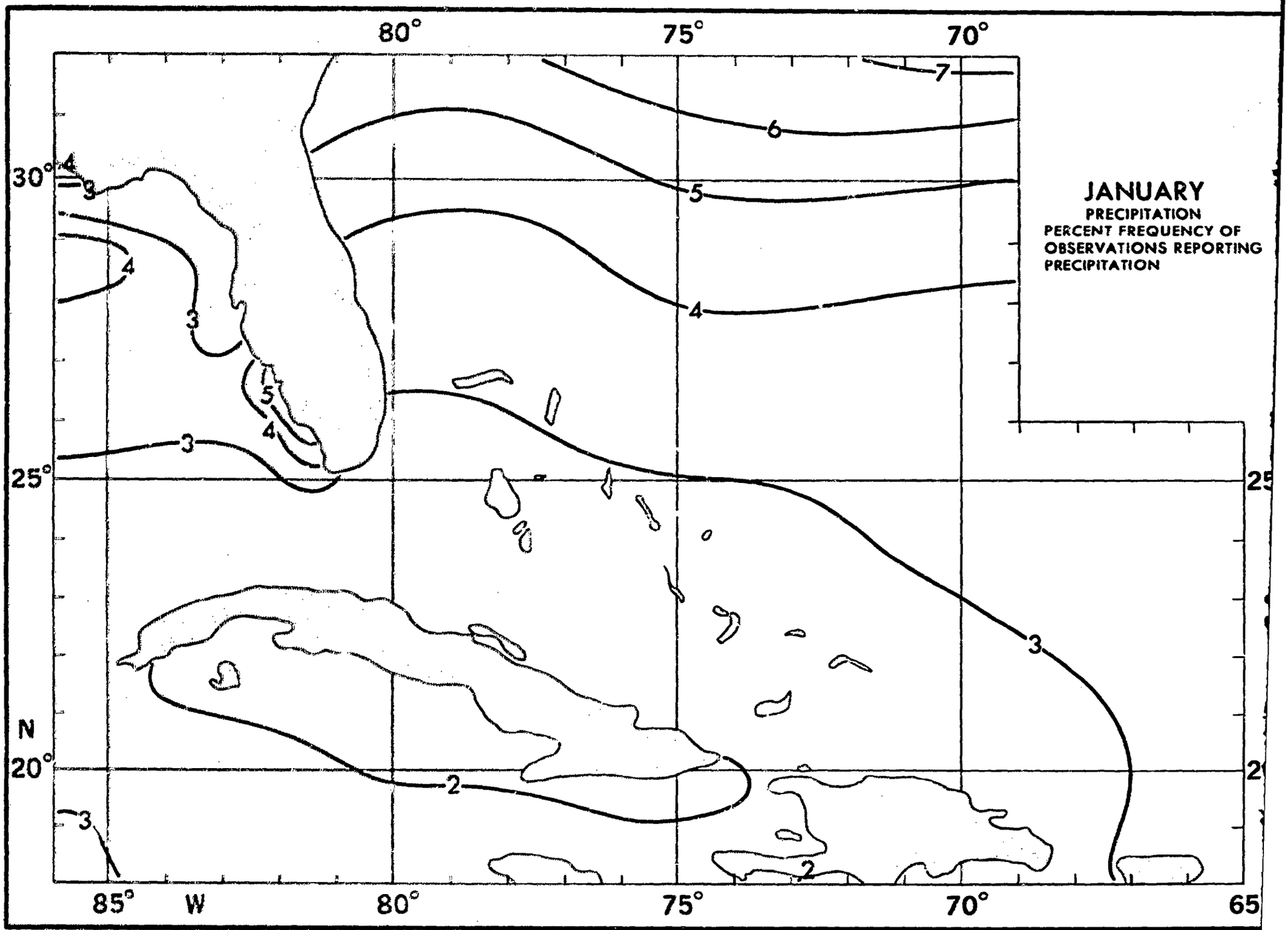
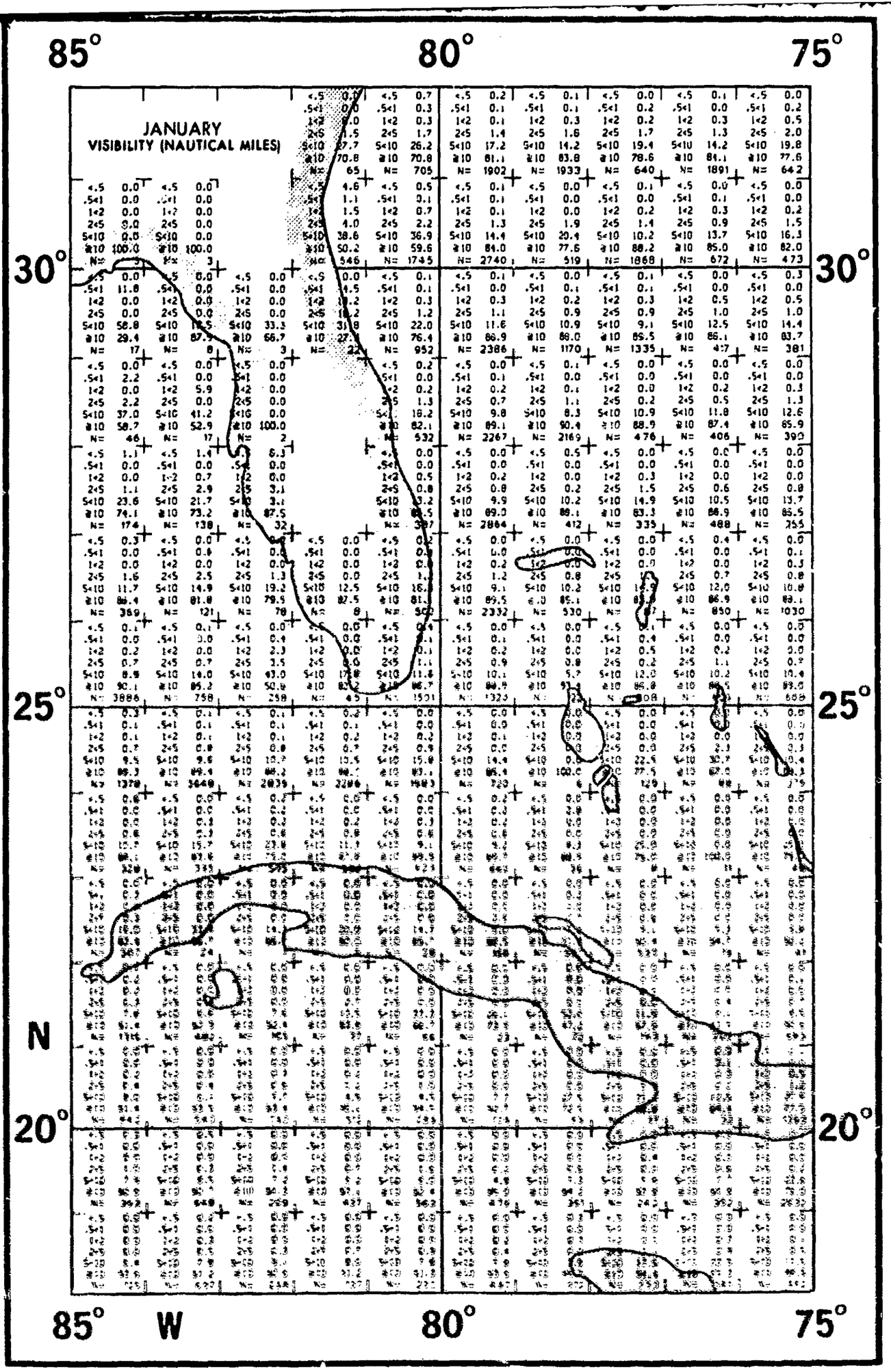
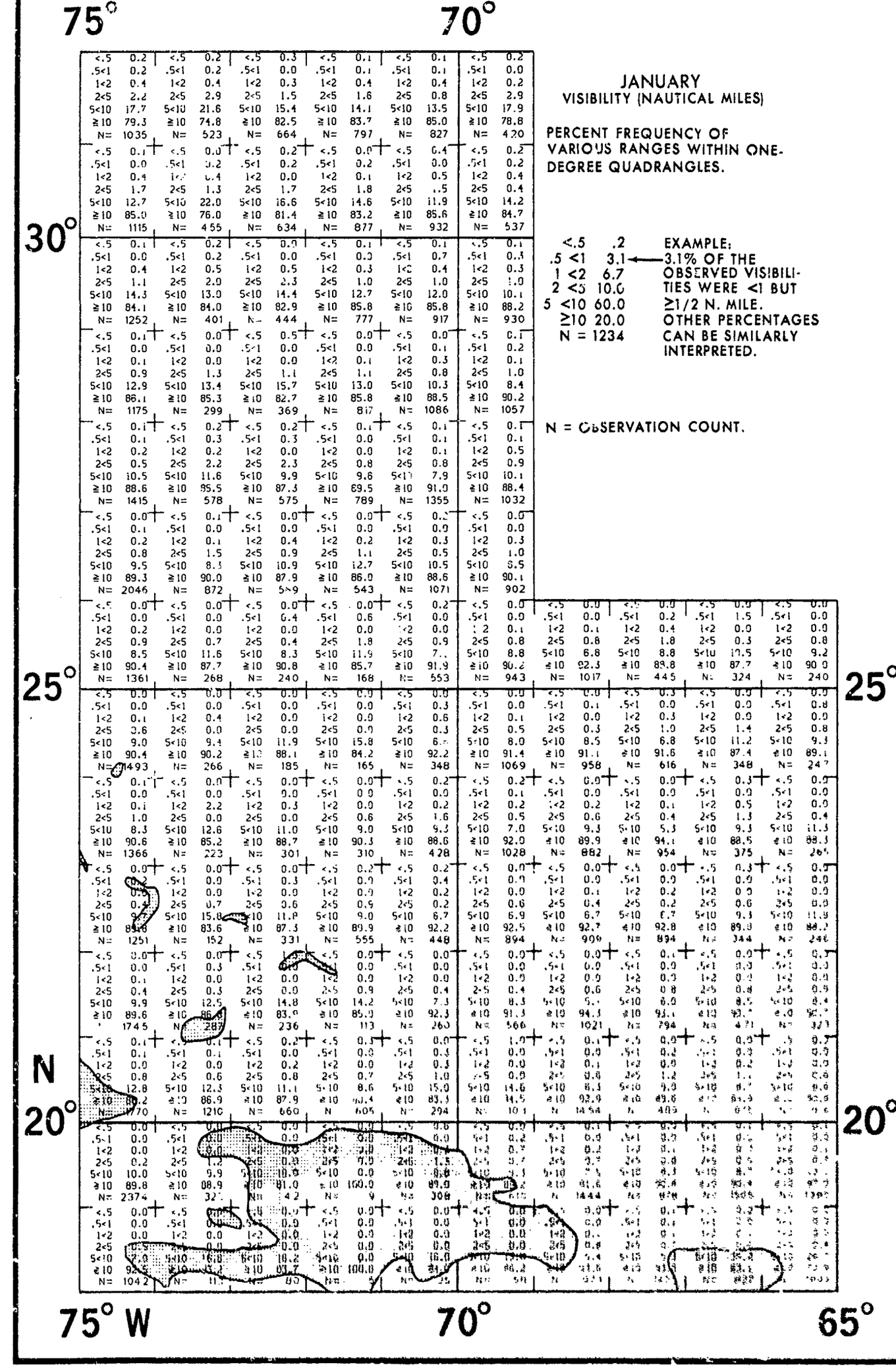
INDEX

MONTH / ELEMENT	CLOUDS	PRECIPITATION	VISIBILITY-TABLES	CEILING-VISIBILITY (mid range)	CEILING-VISIBILITY (low range)	WIND-VISIBILITY-CLOUDINESS	SCALAR MEAN WIND SPEED	WIND SPEED <11 and ≥34 knots	WIND SPEED 11-21 and 22-33 knots	SURFACE WIND ROSES	AIR AND SEA TEMPERATURE	WAVE HEIGHT-ISOPLETHS	WAVE HEIGHT-TABLES	SURFACE CURRENTS (seasonal)
JANUARY	2	3	4	6	7	8	9	10	11	12	14	15	16	
FEBRUARY	18	19	20	22	23	24	25	26	27	28	30	31	32	
MARCH	34	35	36	38	39	40	41	42	43	44	46	47	48	194
APRIL	50	51	52	54	55	56	57	58	59	60	62	63	64	
MAY	66	67	68	70	71	72	73	74	75	76	78	79	80	
JUNE	82	83	84	86	87	88	89	90	91	92	94	95	96	THRU
JULY	98	99	100	102	103	104	105	106	107	108	110	111	112	
AUGUST	114	115	116	118	119	120	121	122	123	124	126	127	128	
SEPTEMBER	130	131	132	134	135	136	137	138	139	140	142	143	144	
OCTOBER	146	147	148	150	151	152	153	154	155	156	158	159	160	198
NOVEMBER	162	163	164	166	167	168	169	170	171	172	174	175	176	
DECEMBER	178	179	180	182	183	184	185	186	187	188	190	191	192	


80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°
JANUARY
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/8


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65
JANUARY
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION
7
6
5
4
3
2


JANUARY
VISIBILITY (NAUTICAL MILES)
85°
80°
75°
30°
25°
20°
N
85° W
80°
75°

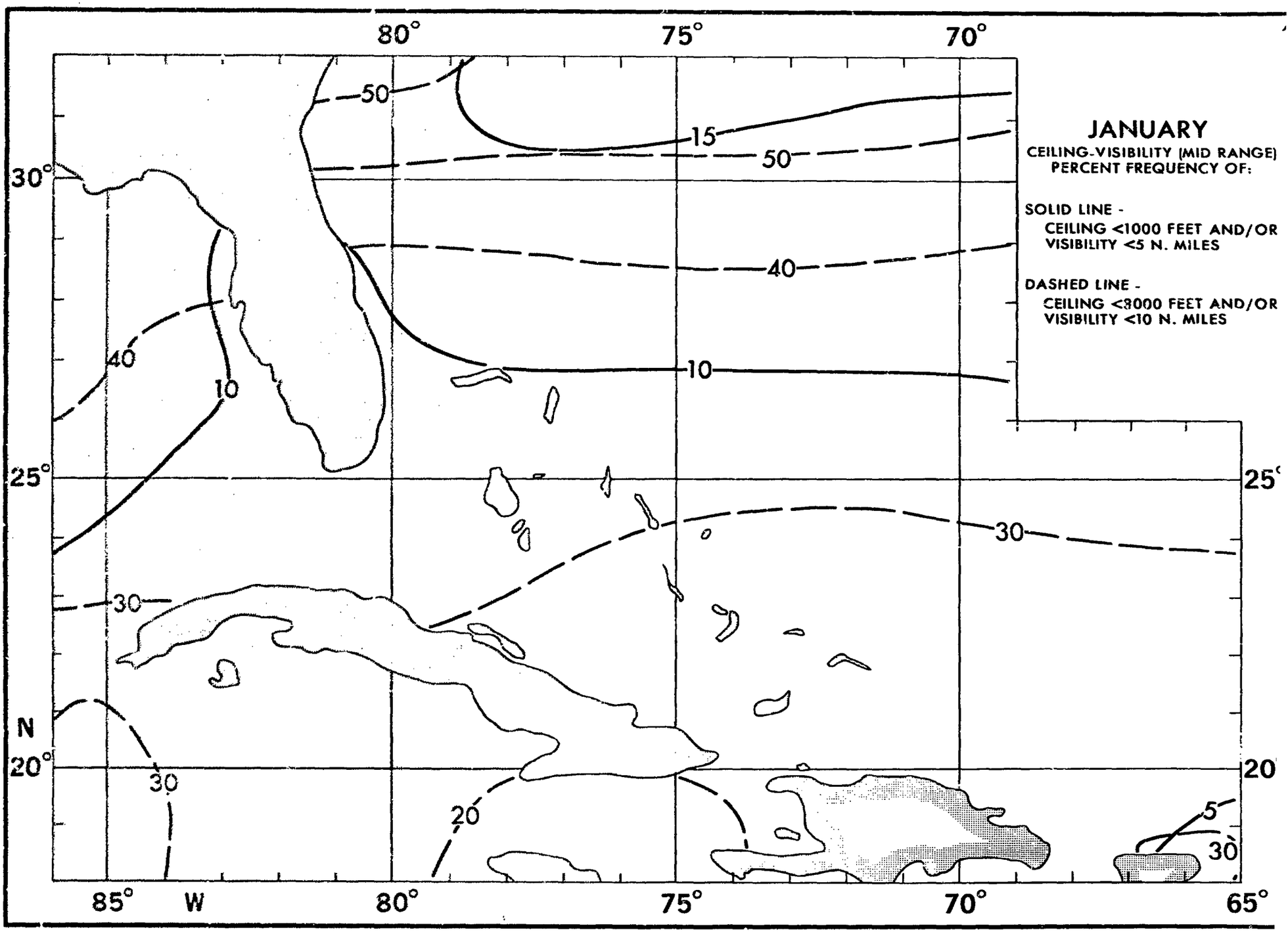


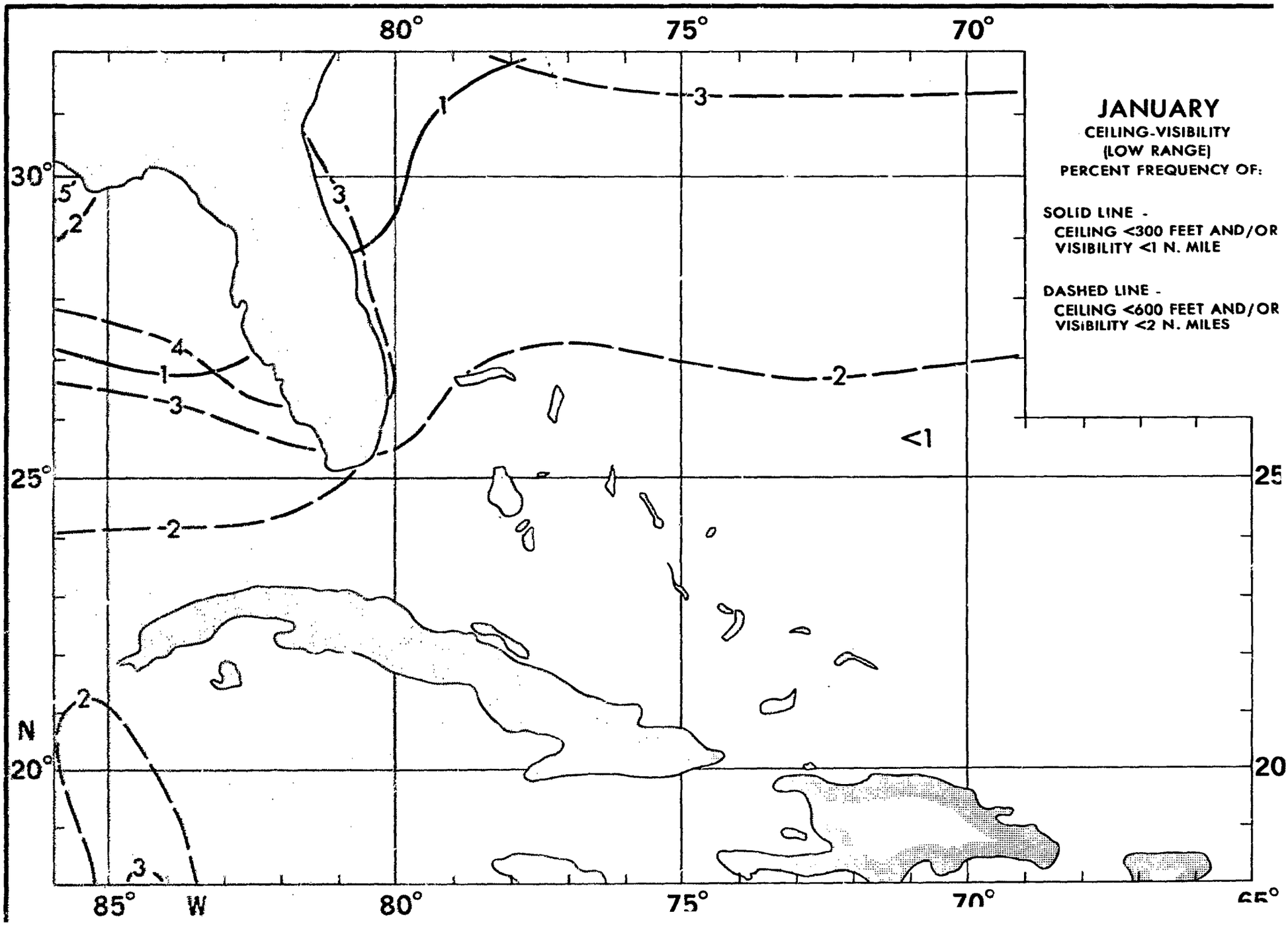
JANUARY
VISIBILITY (NAUTICAL MILES)

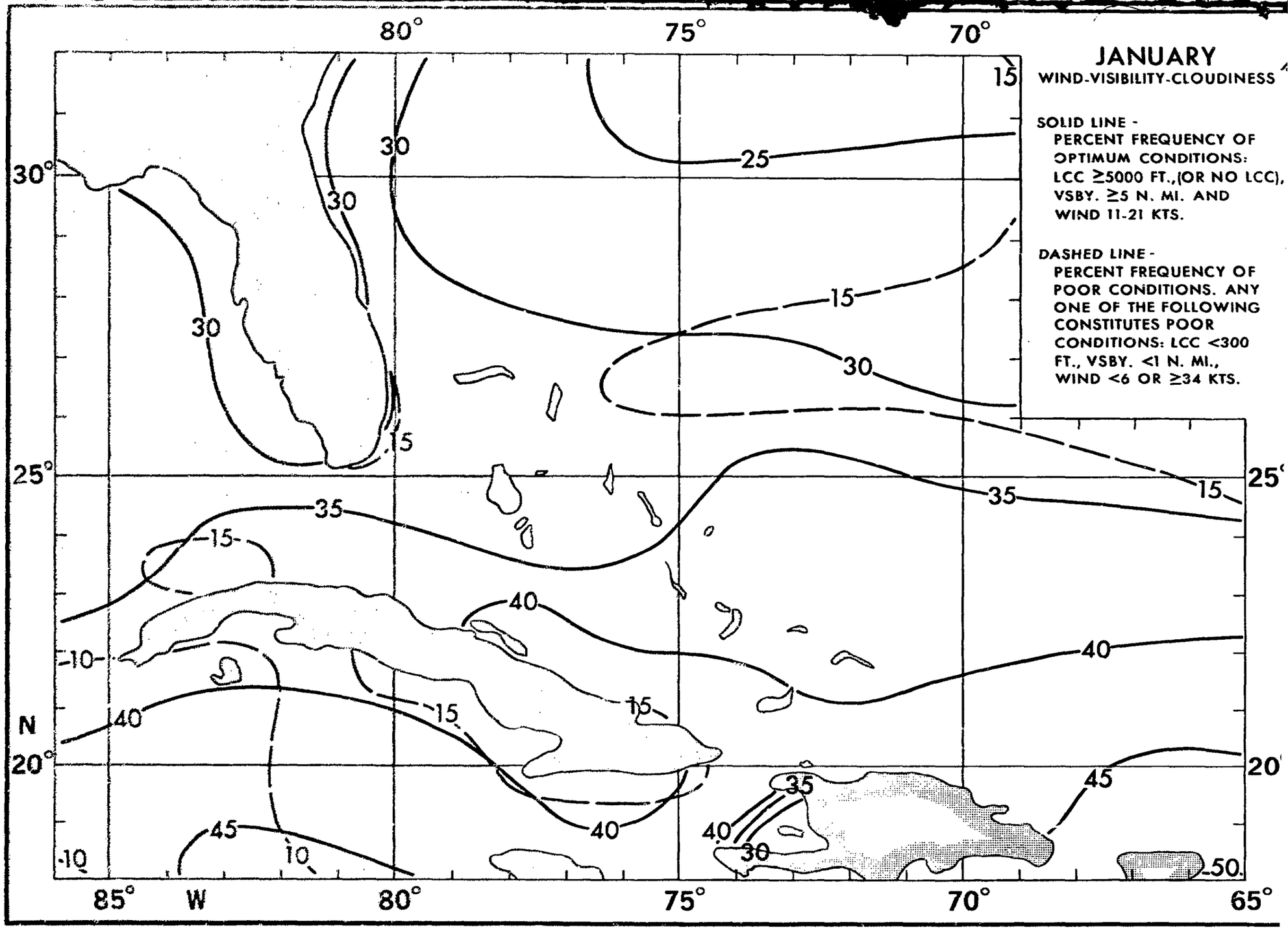
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

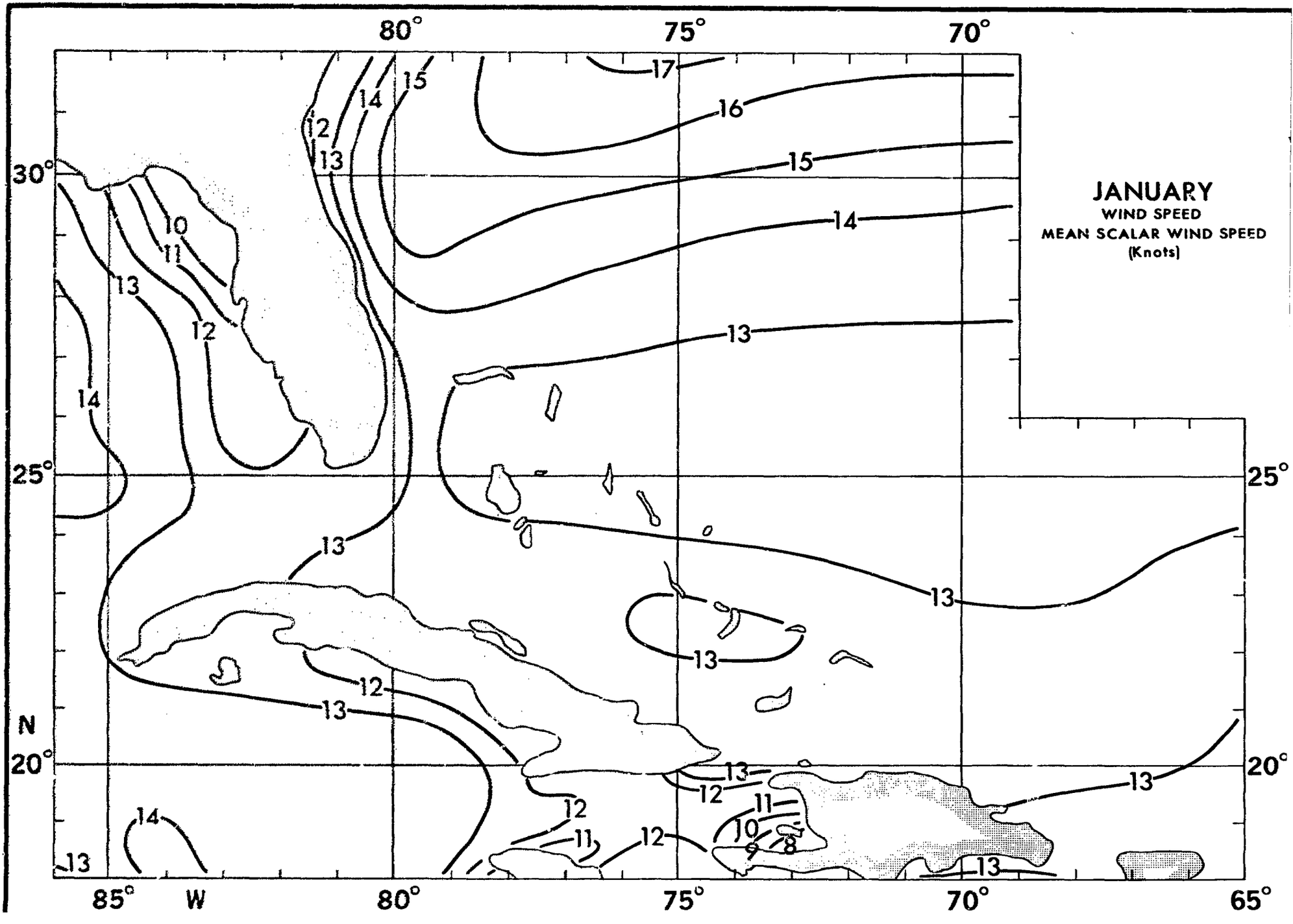
<.5	.2	EXAMPLE:
.5 <1	3.1	← 3.1% OF THE
1 <2	6.7	OBSERVED VISIBILI-
2 <5	10.6	TIES WERE <1 BUT
5 <10	60.0	≥1/2 N. MILE.
≥10	20.0	OTHER PERCENTAGES
N =	1234	CAN BE SIMILARLY INTERPRETED.

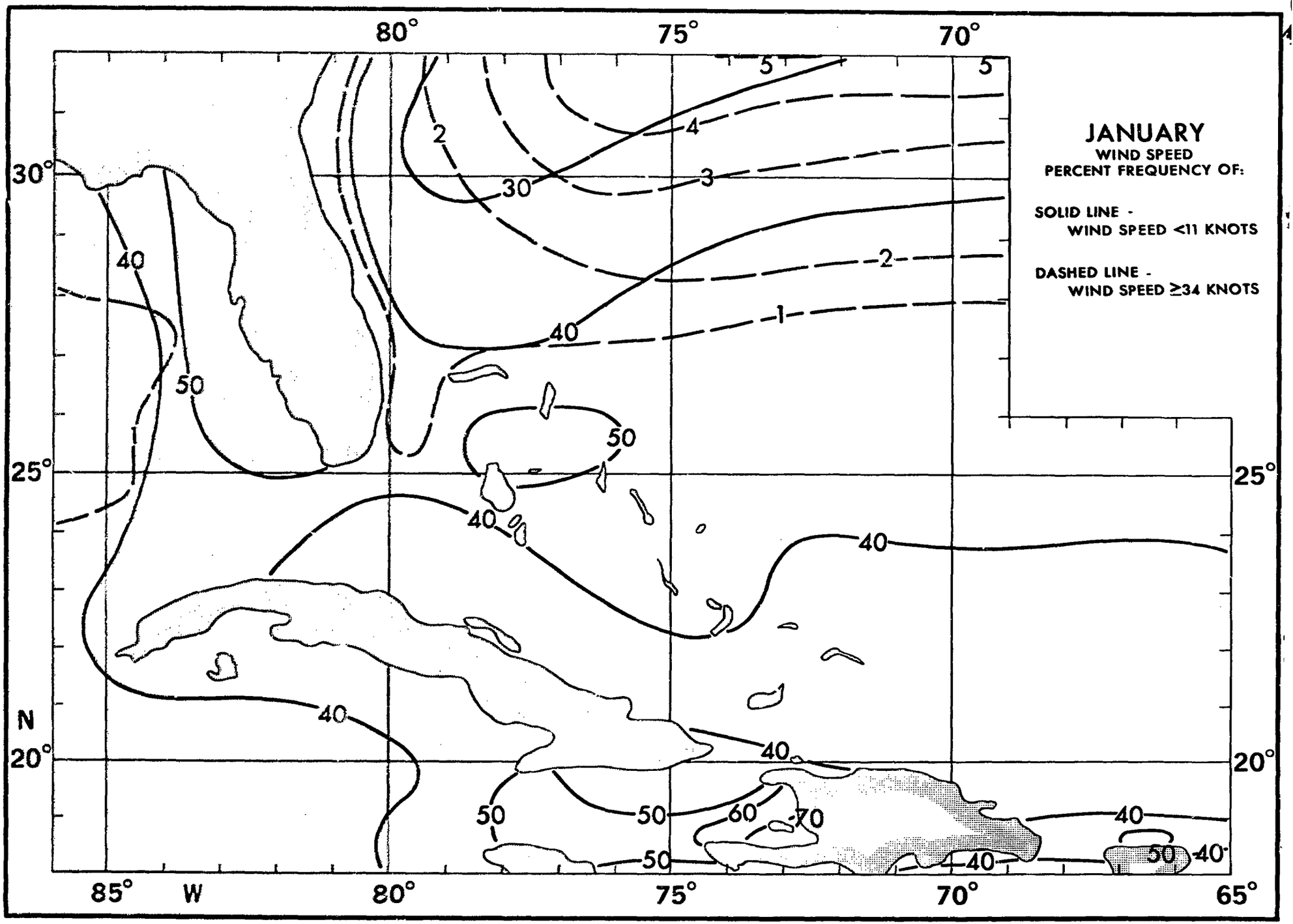
N = OBSERVATION COUNT.

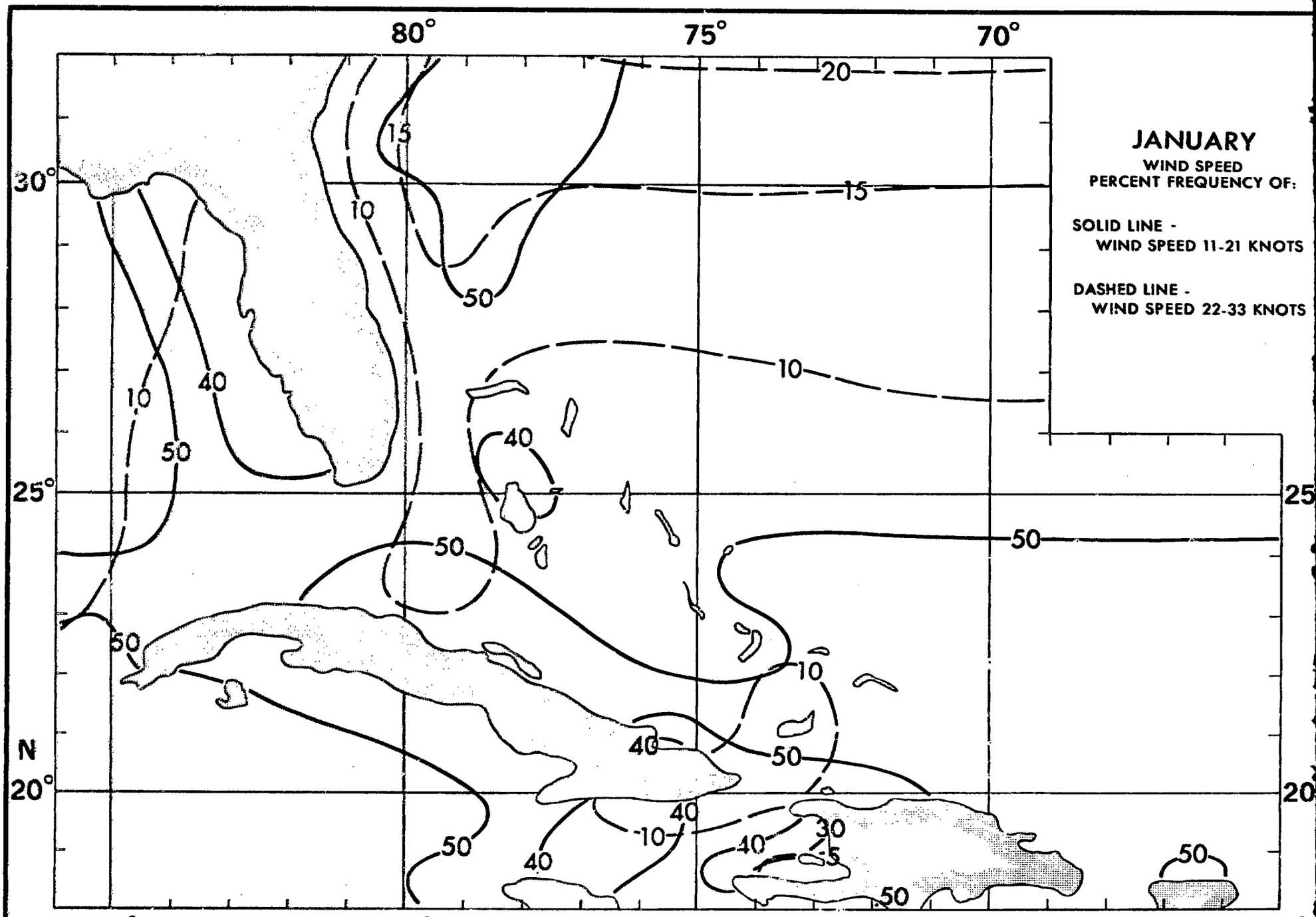

80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°
50
15
50
40
40
10
10
30
30
20
5
30
JANUARY
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <3000 FEET AND/OR
VISIBILITY <10 N. MILES

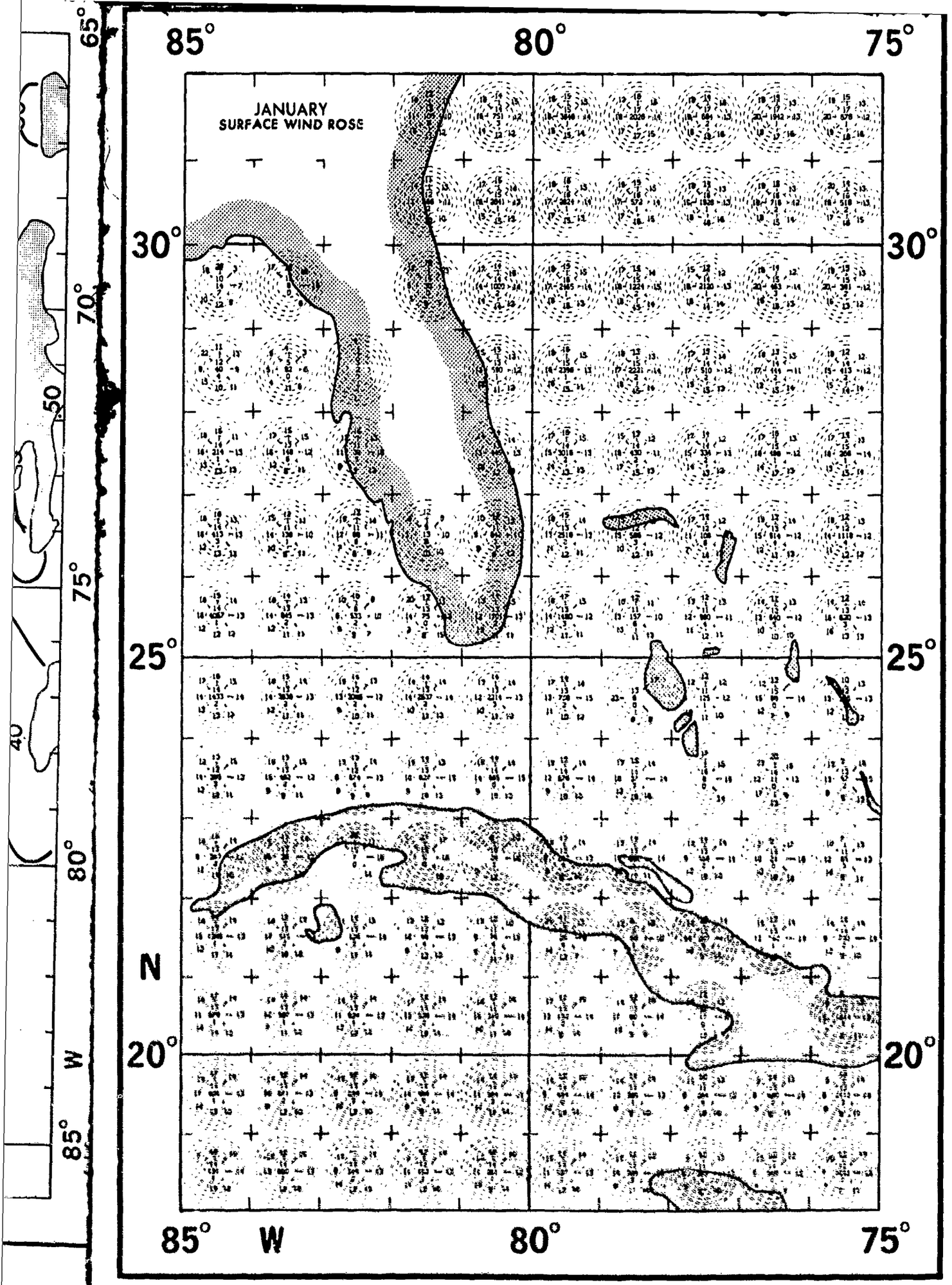

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
JANUARY
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE -
CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES
<1
1
2
3
4
5

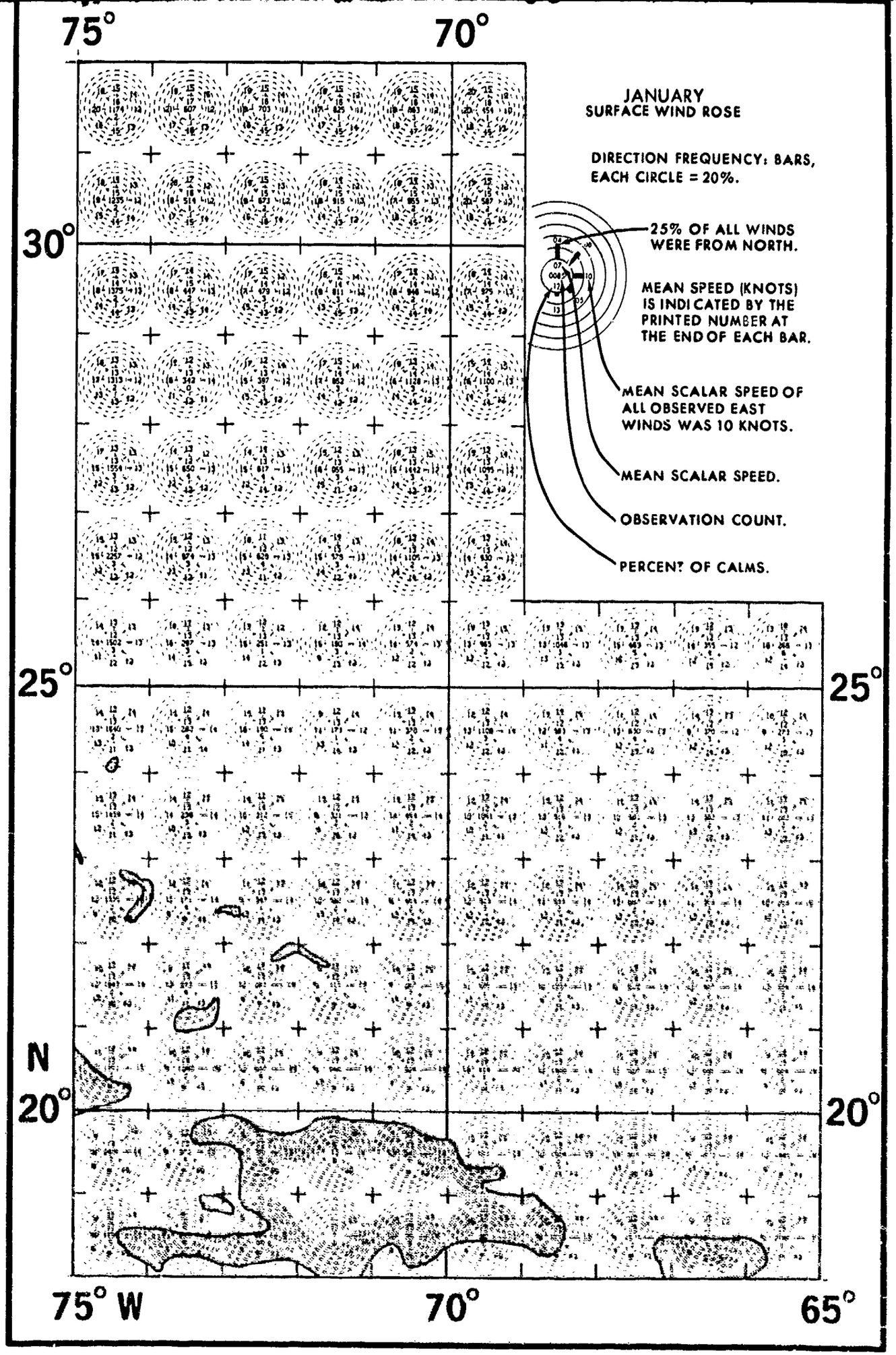

JANUARY
WIND-VISIBILITY-CLOUDINESS
SOLID LINE -
PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE -
PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
85° W
80°
75°
70°
65°
30°
25°
20° N
15
25
30
35
40
45
10
50

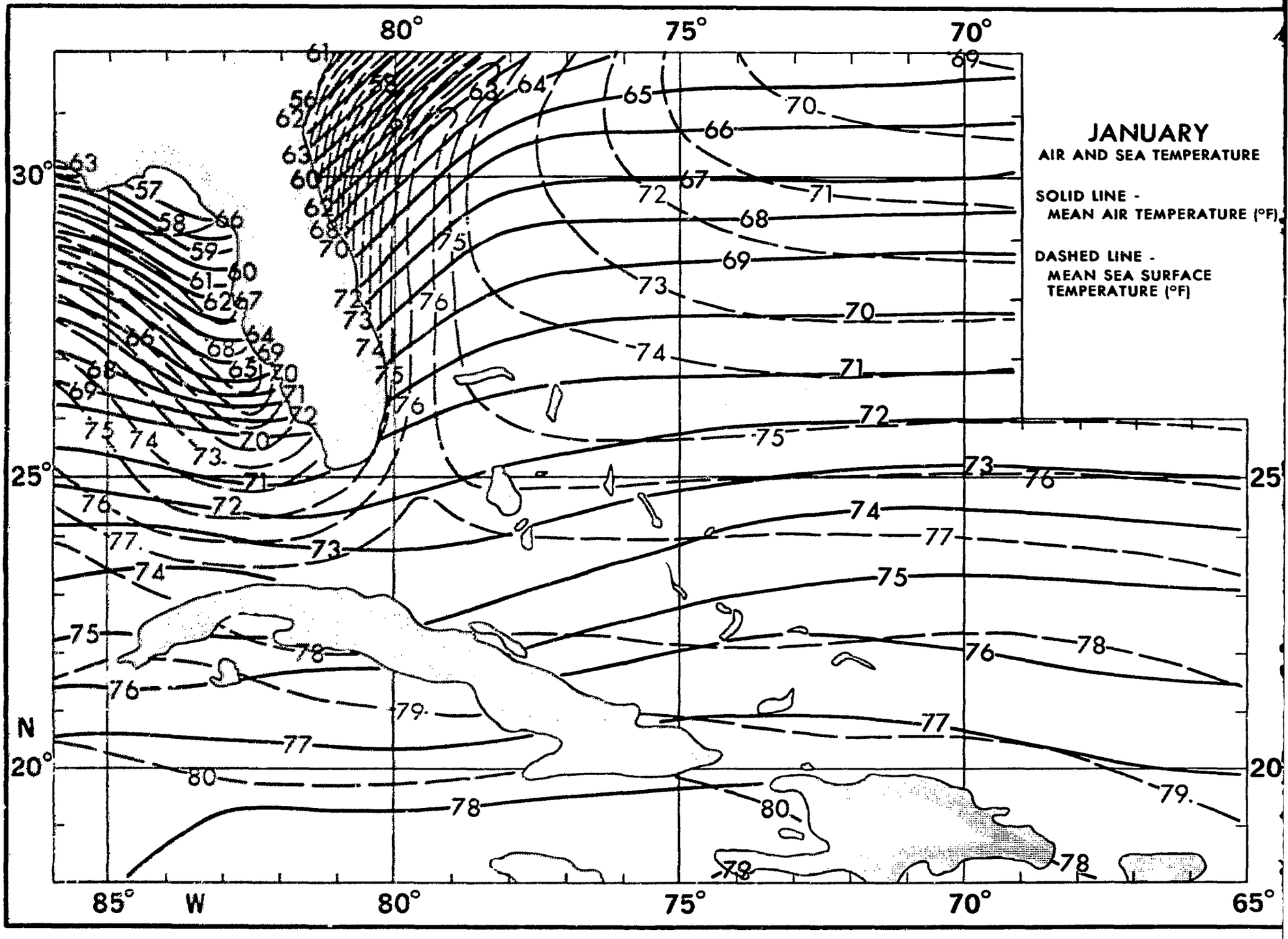

JANUARY
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
17
16
15
14
13
12
11
10
9
8

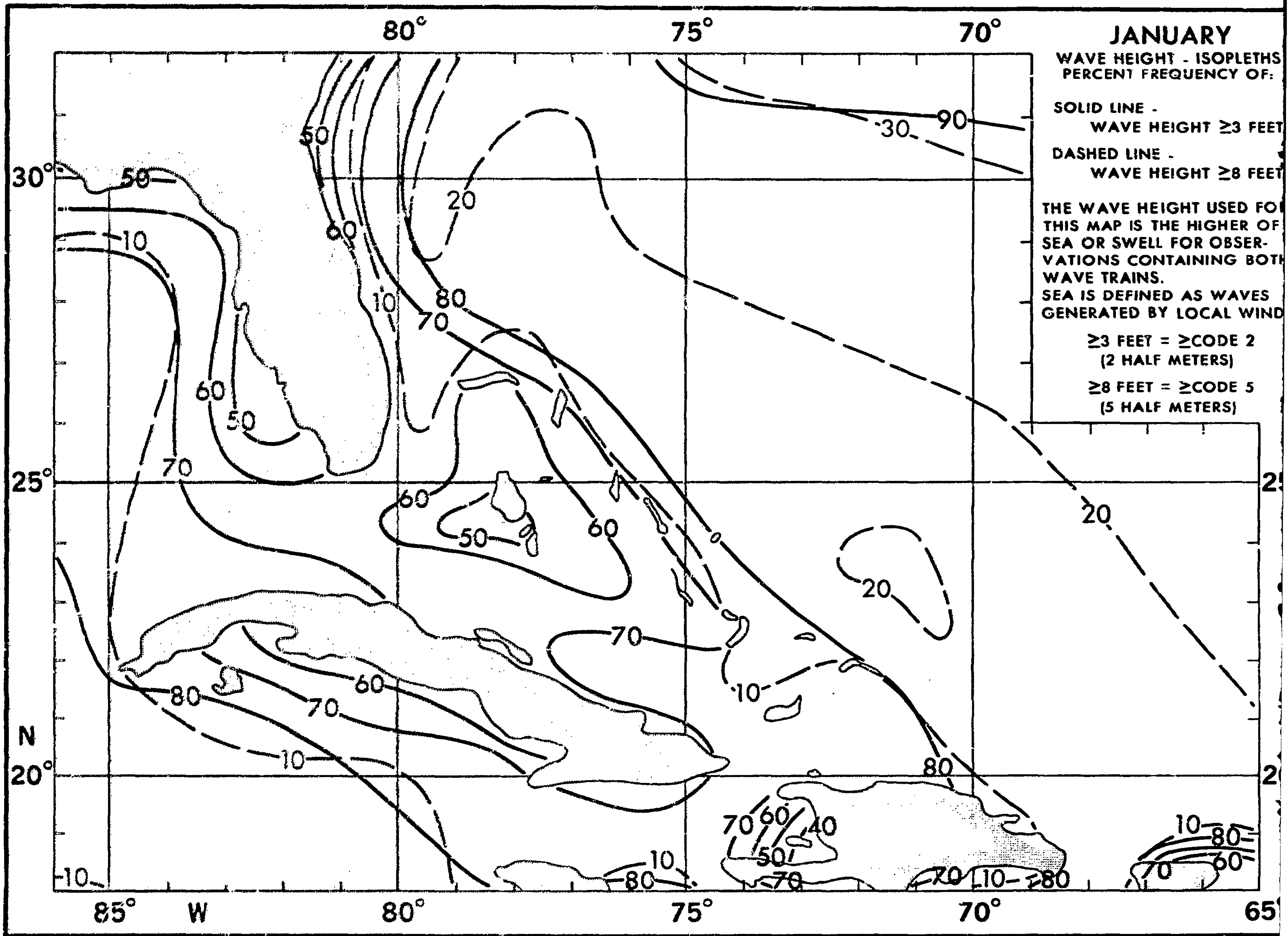

JANUARY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
5
4
3
2
1
30
40
50
60
70

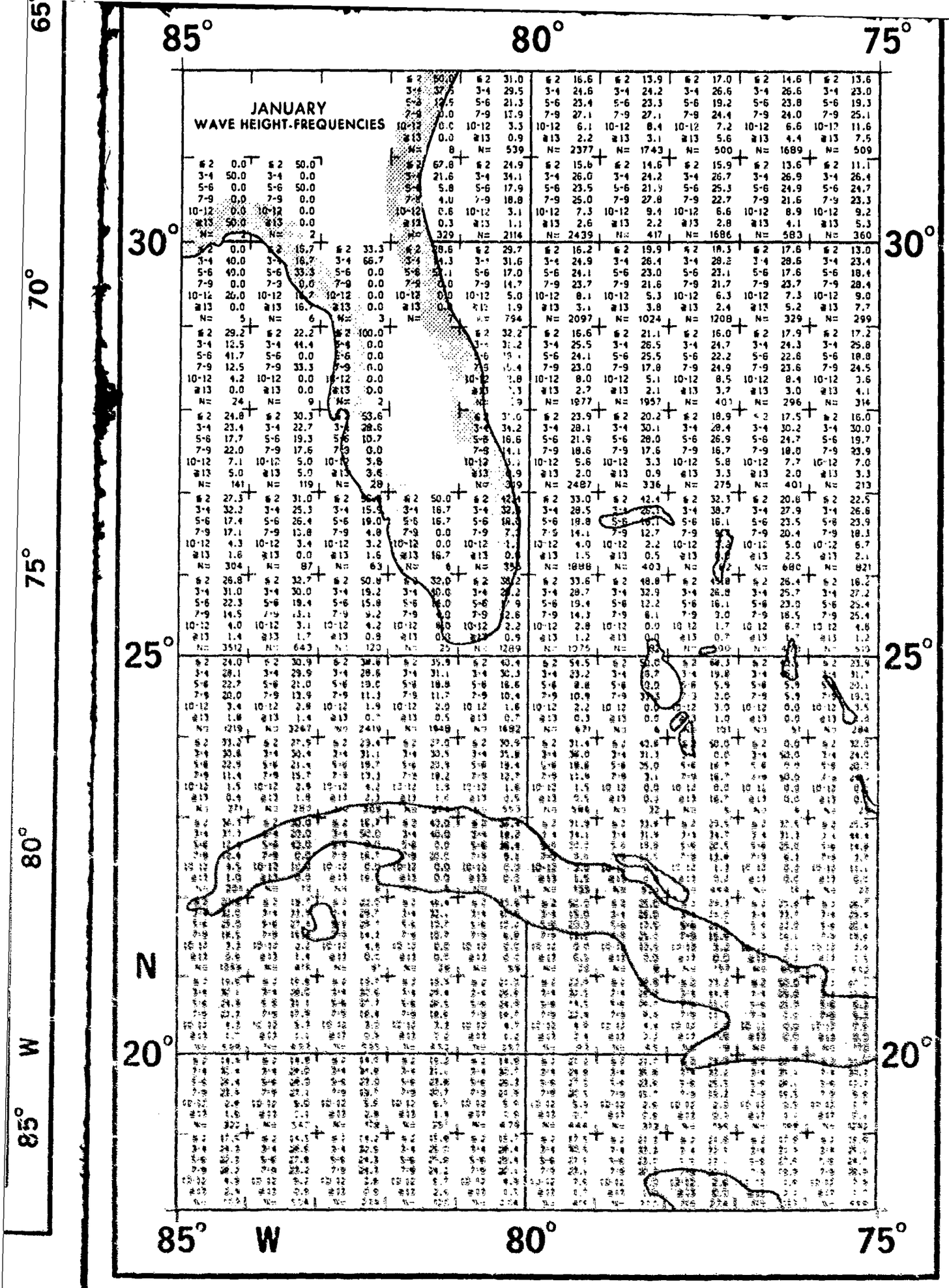

80°
75°
70°
30°
25°
20°
N
JANUARY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED 11-21 KNOTS
DASHED LINE -
WIND SPEED 22-33 KNOTS
20
15
10
50
40
30
5

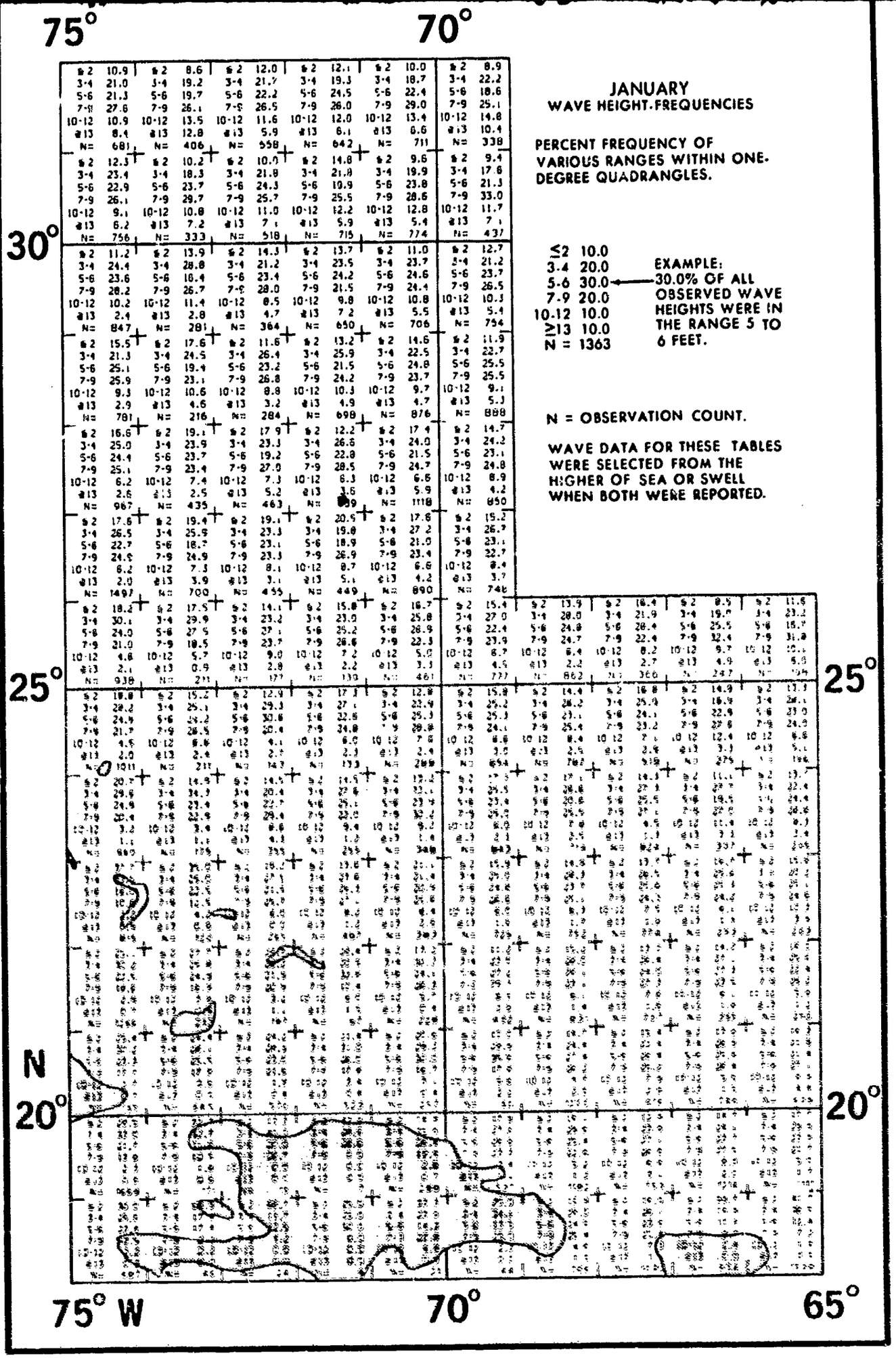

JANUARY
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
W


75°
70°
30°
25°
20°
N
75° W
70°
65°
JANUARY
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


JANUARY
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°


JANUARY
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEET
DASHED LINE -
WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY LOCAL WIND
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
85°
W
80°
75°
70°
65°
30°
25°
N
20°


JANUARY
WAVE HEIGHT-FREQUENCIES
85°
80°
75°
30°
25°
20°
N
W



JANUARY
WAVE HEIGHT-FREQUENCIES

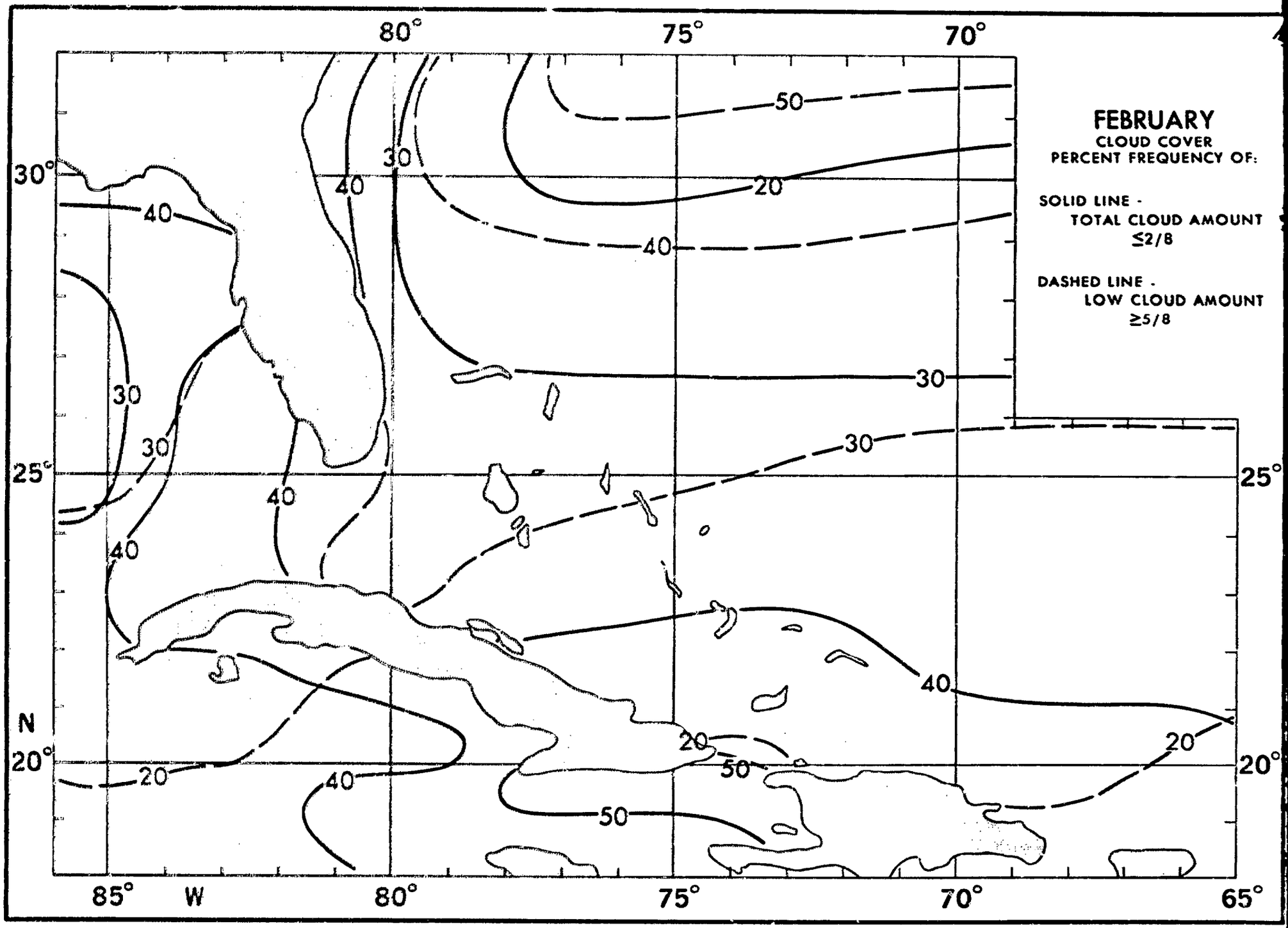
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

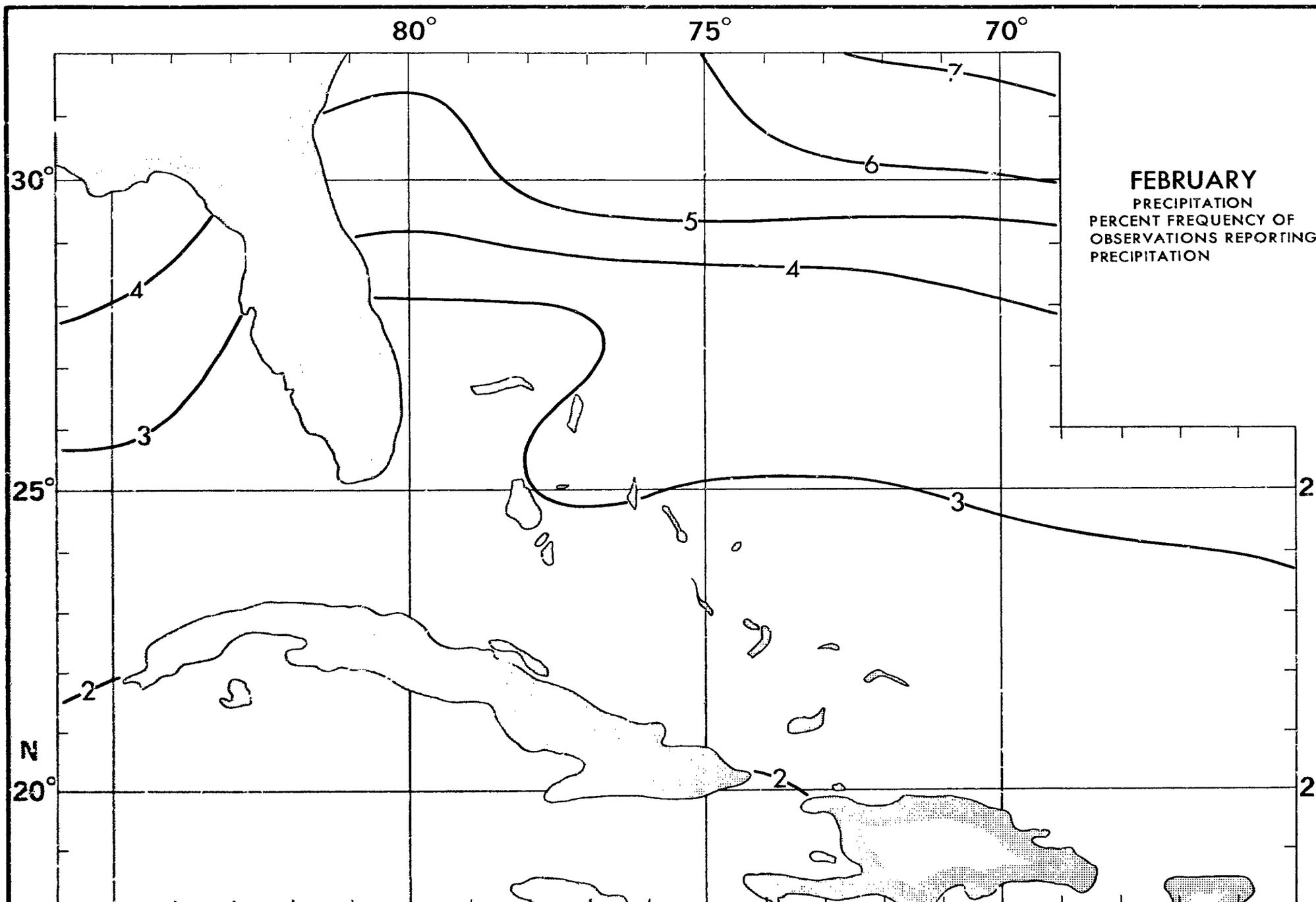
≤2	10.0
3-4	20.0
5-6	30.0
7-9	20.0
10-12	10.0
≥13	10.0
N =	1363

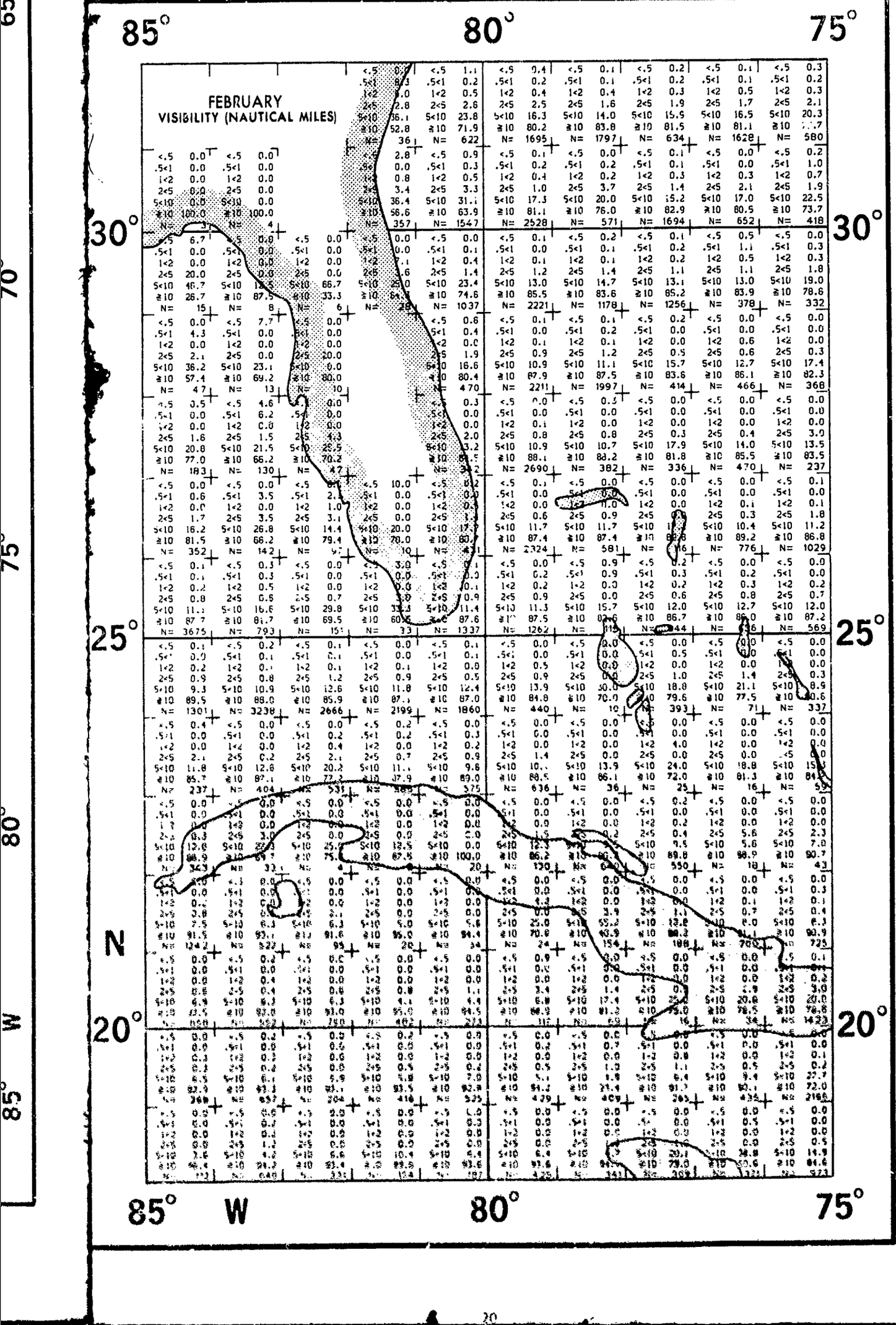
EXAMPLE: 30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.

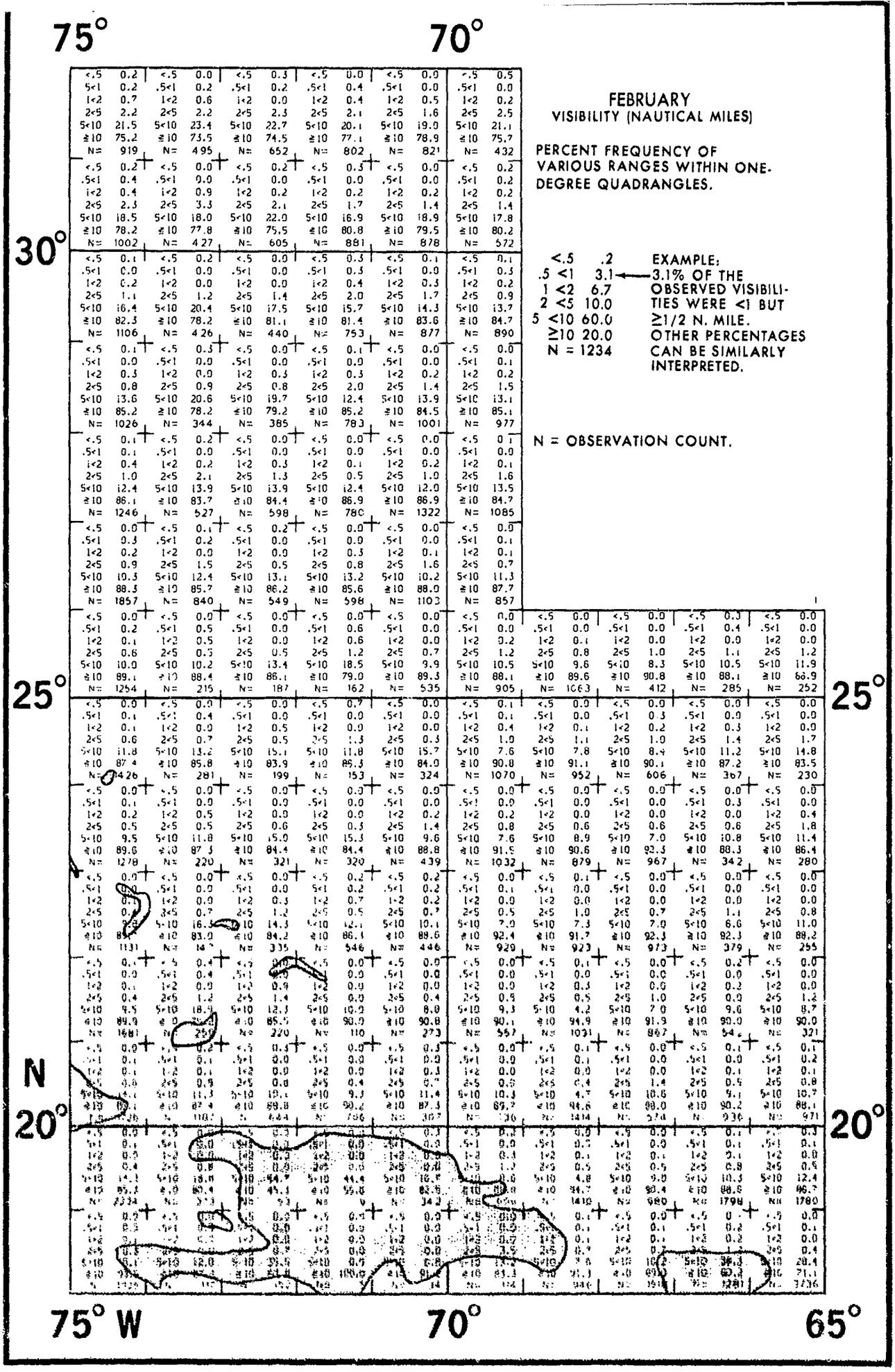
N = OBSERVATION COUNT.

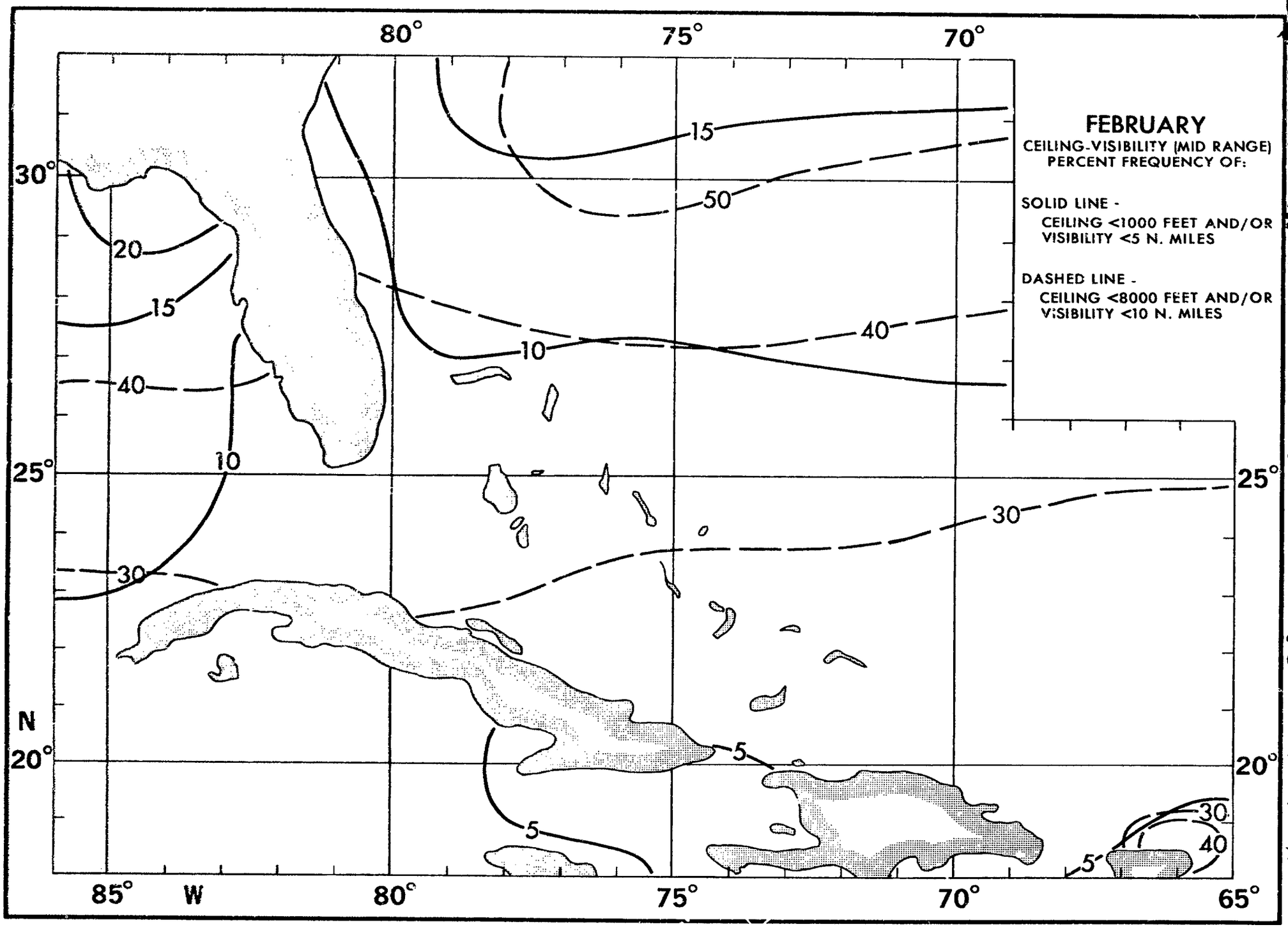
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

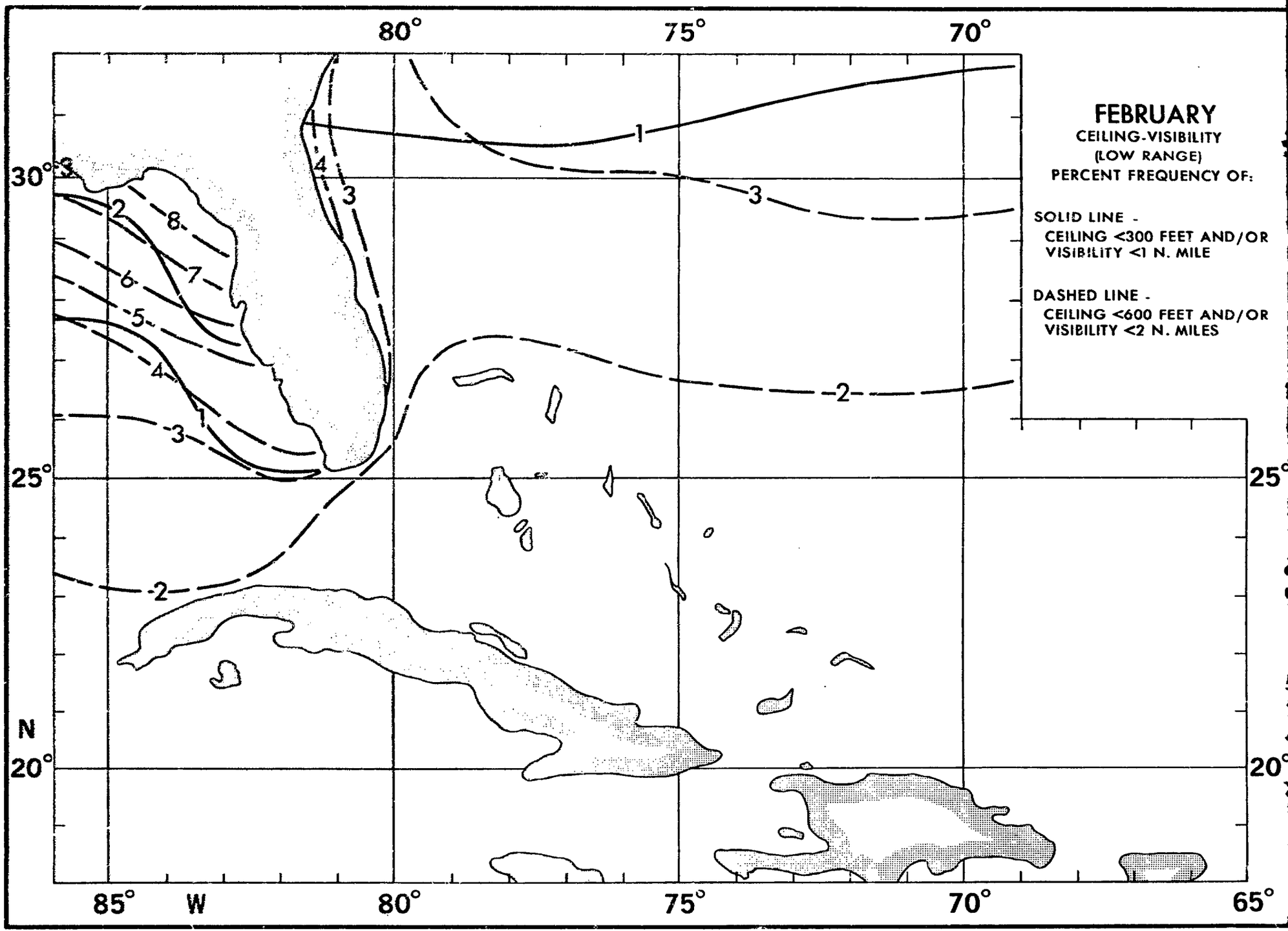

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
50
40
30
20
FEBRUARY
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/8

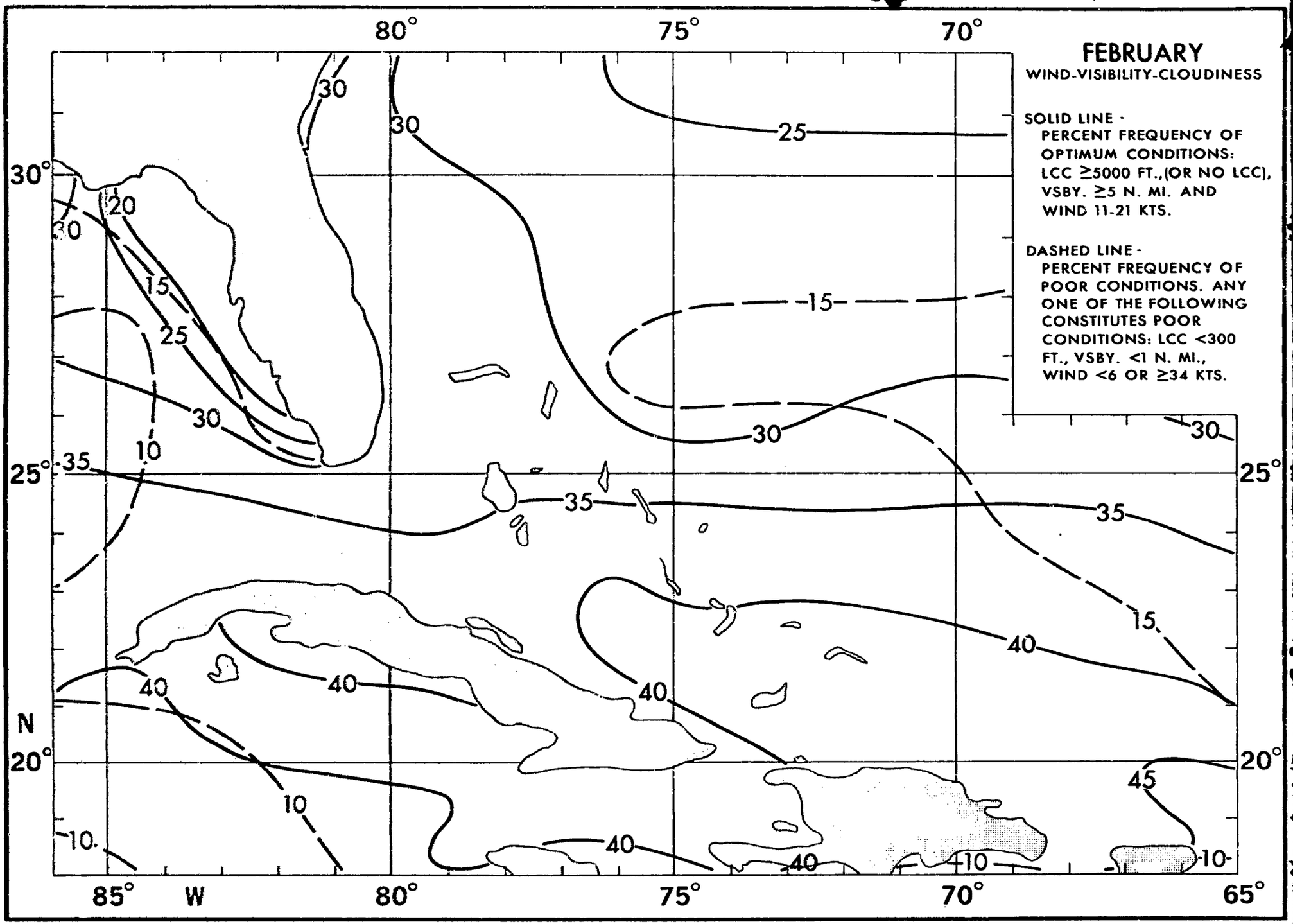

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
7
6
5
4
4
3
3
2
2
2
FEBRUARY
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION

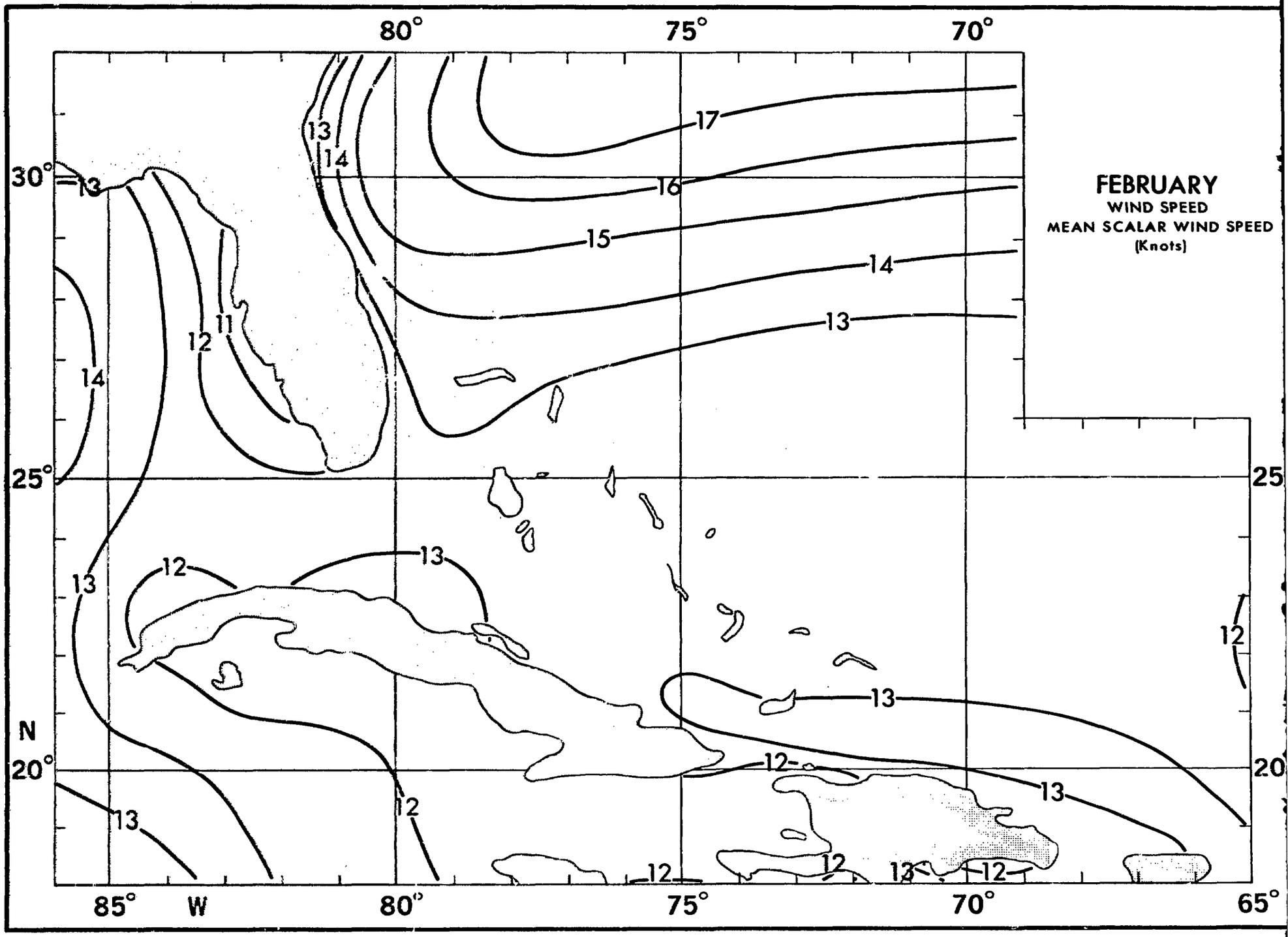

FEBRUARY
VISIBILITY (NAUTICAL MILES)
85°
80°
75°
30°
25°
20°
N
W

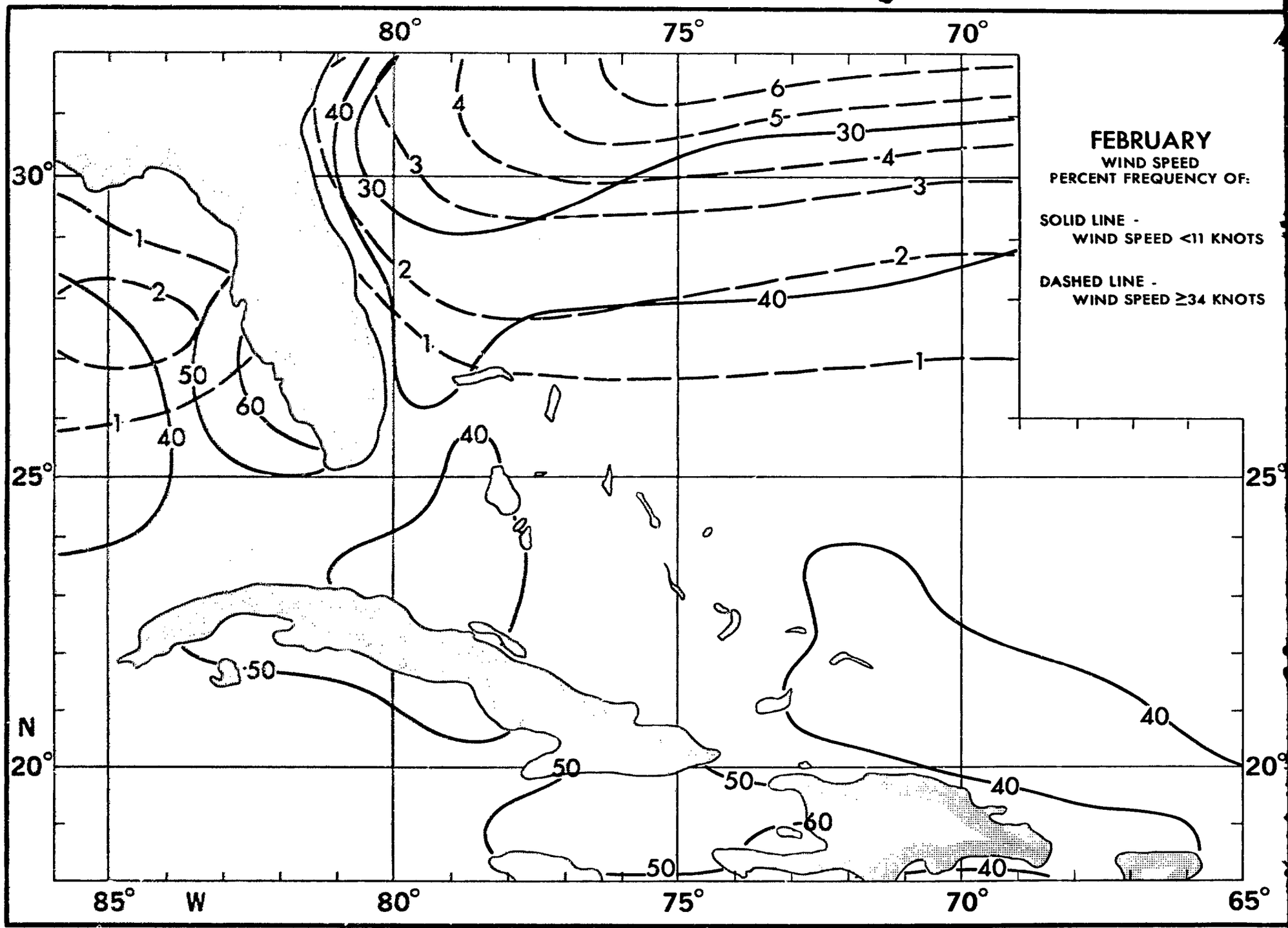

75°
70°
30°
25°
N
20°
75° W
70°
65°
FEBRUARY
VISIBILITY (NAUTICAL MILES)
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
<.5 .2
.5 <1 3.1
1 <2 6.7
2 <5 10.0
5 <10 60.0
≥10 20.0
N = 1234
EXAMPLE:
3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE.
OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.
N = OBSERVATION COUNT.

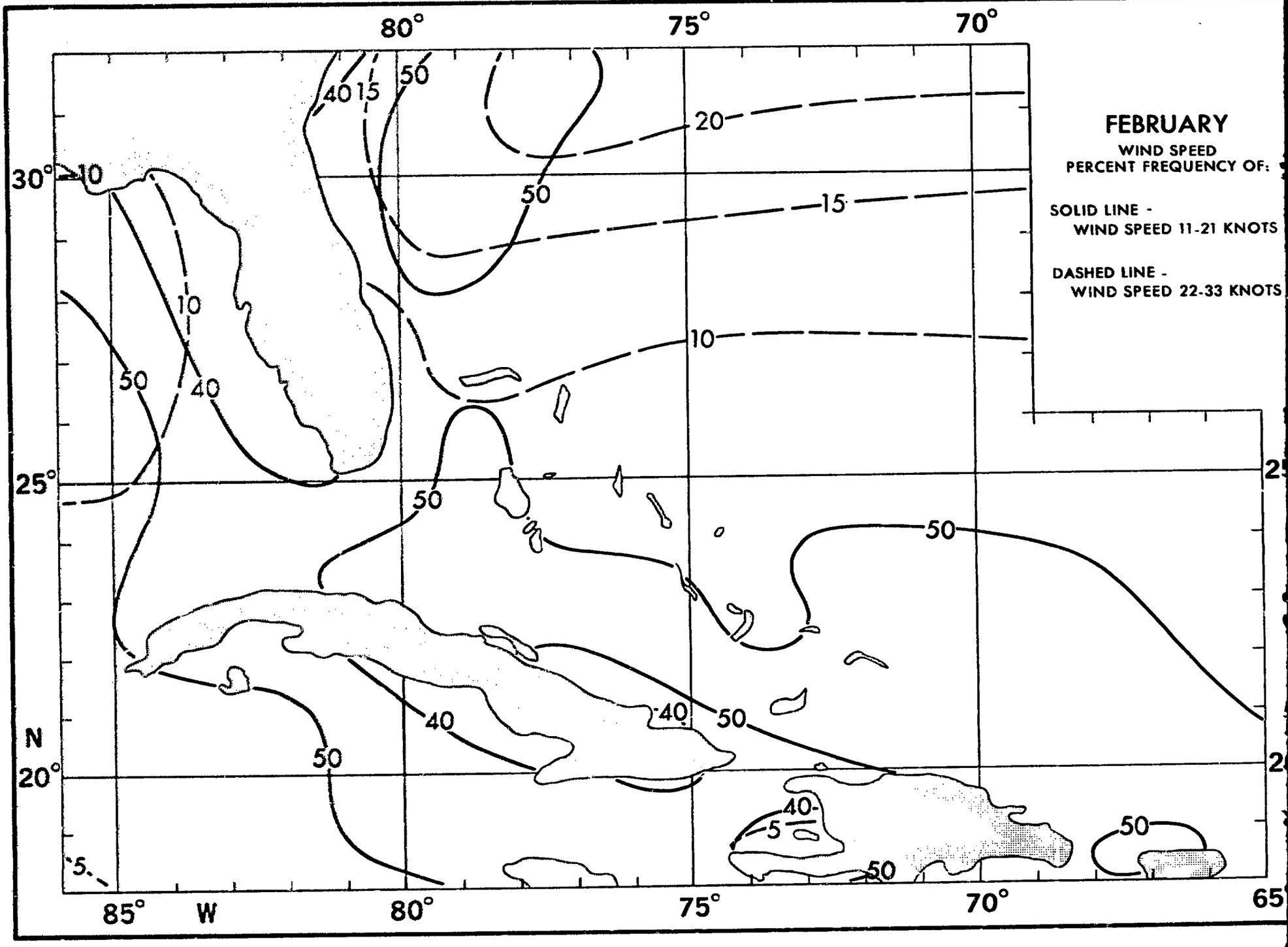

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
FEBRUARY
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES
15
50
20
15
40
10
40
10
30
30
5
5
30
40
5

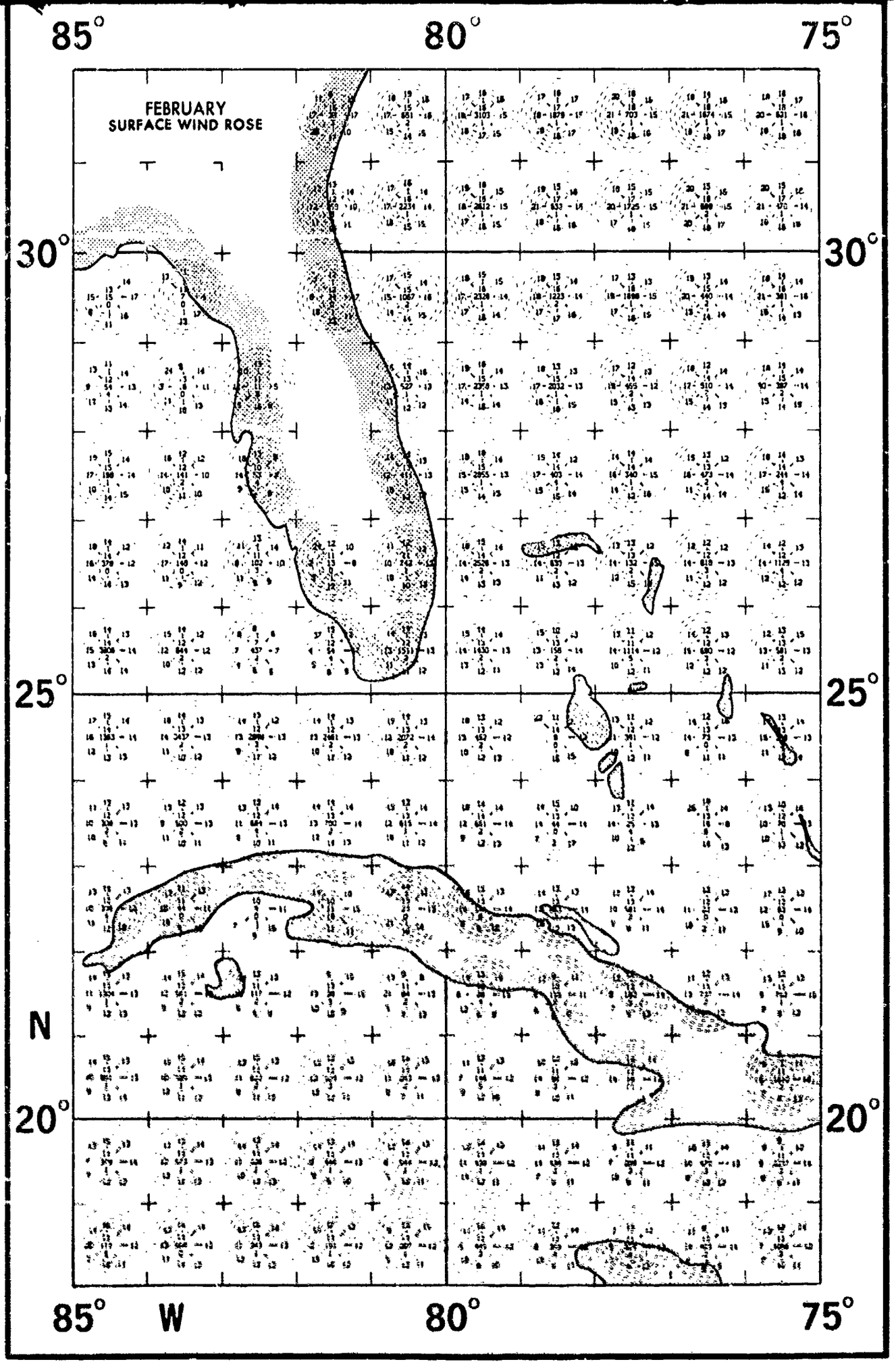

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
FEBRUARY
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE -
CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES
1
2
3
4
5
6
7
8

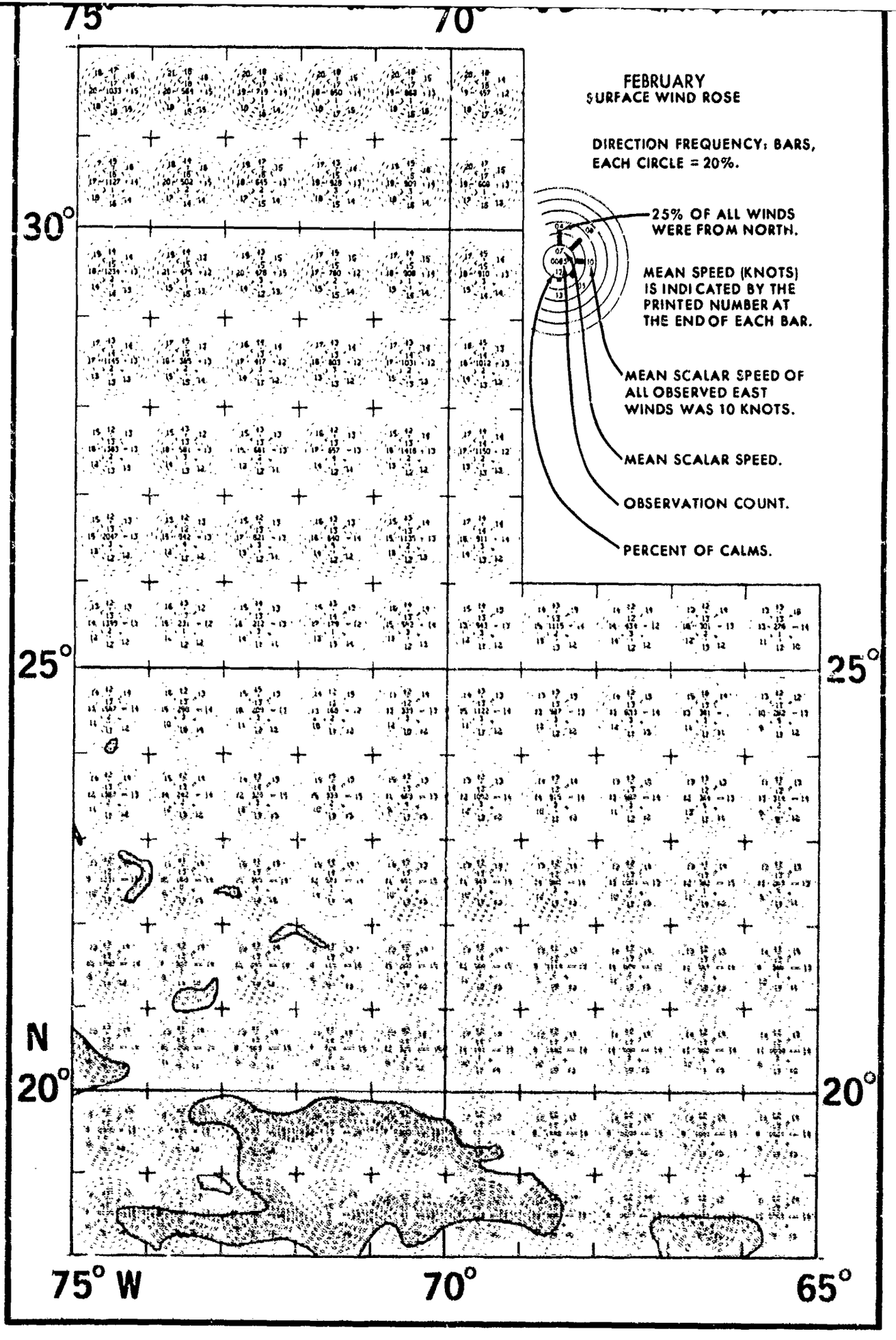

FEBRUARY
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
30
30
25
20
30
15
25
30
10
35
35
35
30
30
15
40
40
40
40
10
10
40
40
10
45
10

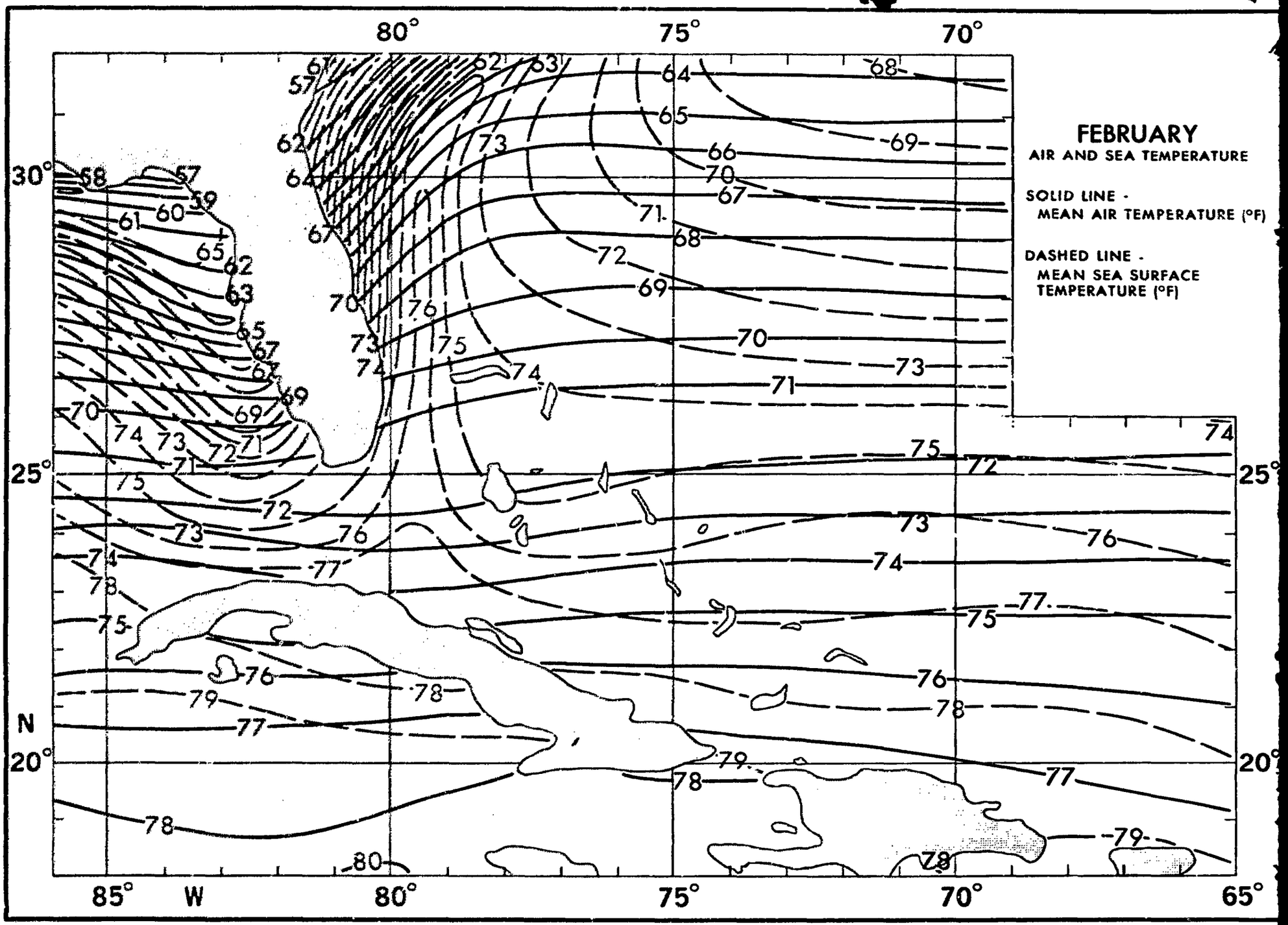

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
FEBRUARY
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)
17
16
15
14
13
12
11

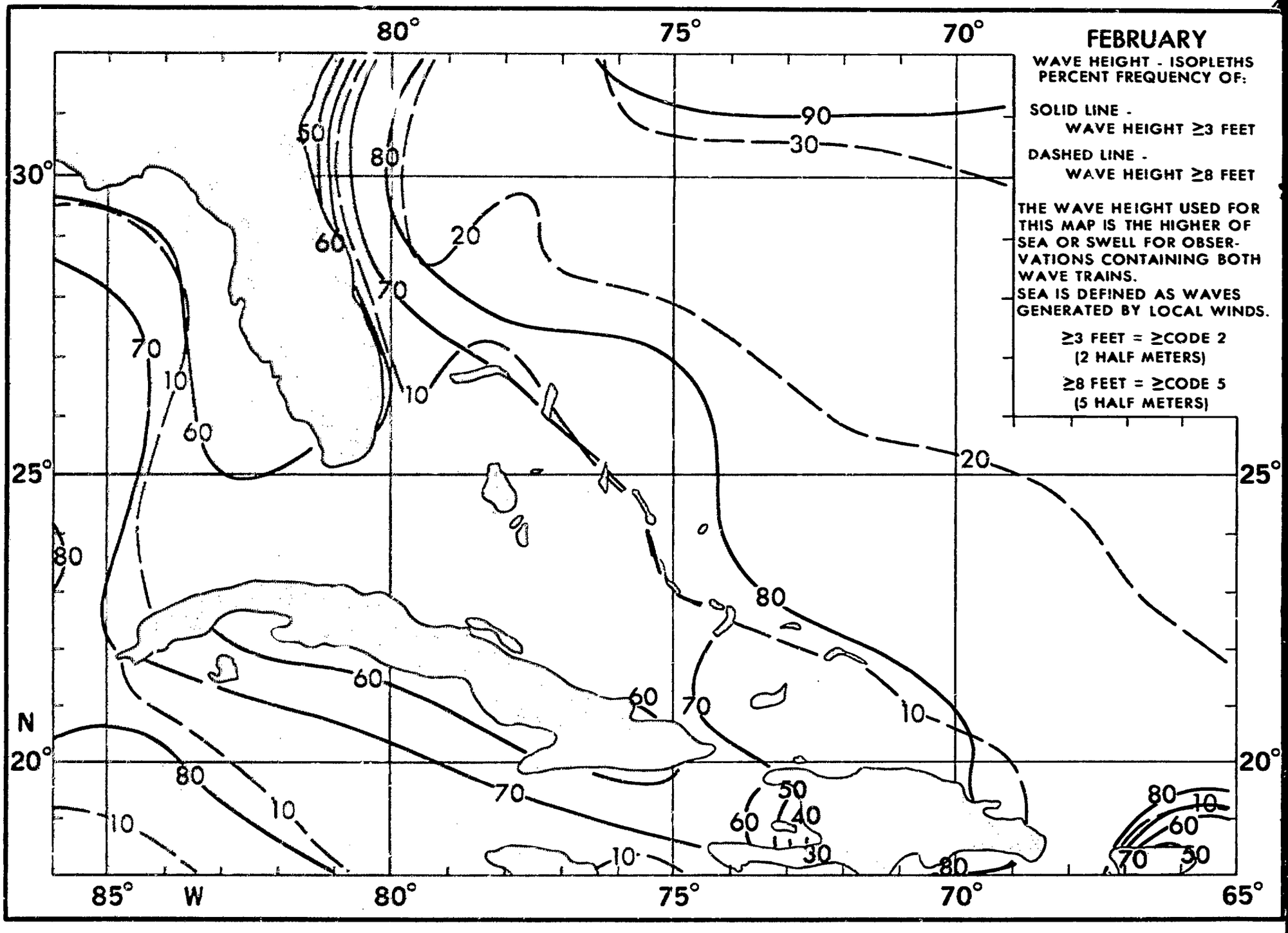

80°
75°
70°
30°
25°
N
20°
85°
W
80°
75°
70°
65°
FEBRUARY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS
1
2
3
4
5
6
30
40
50
60

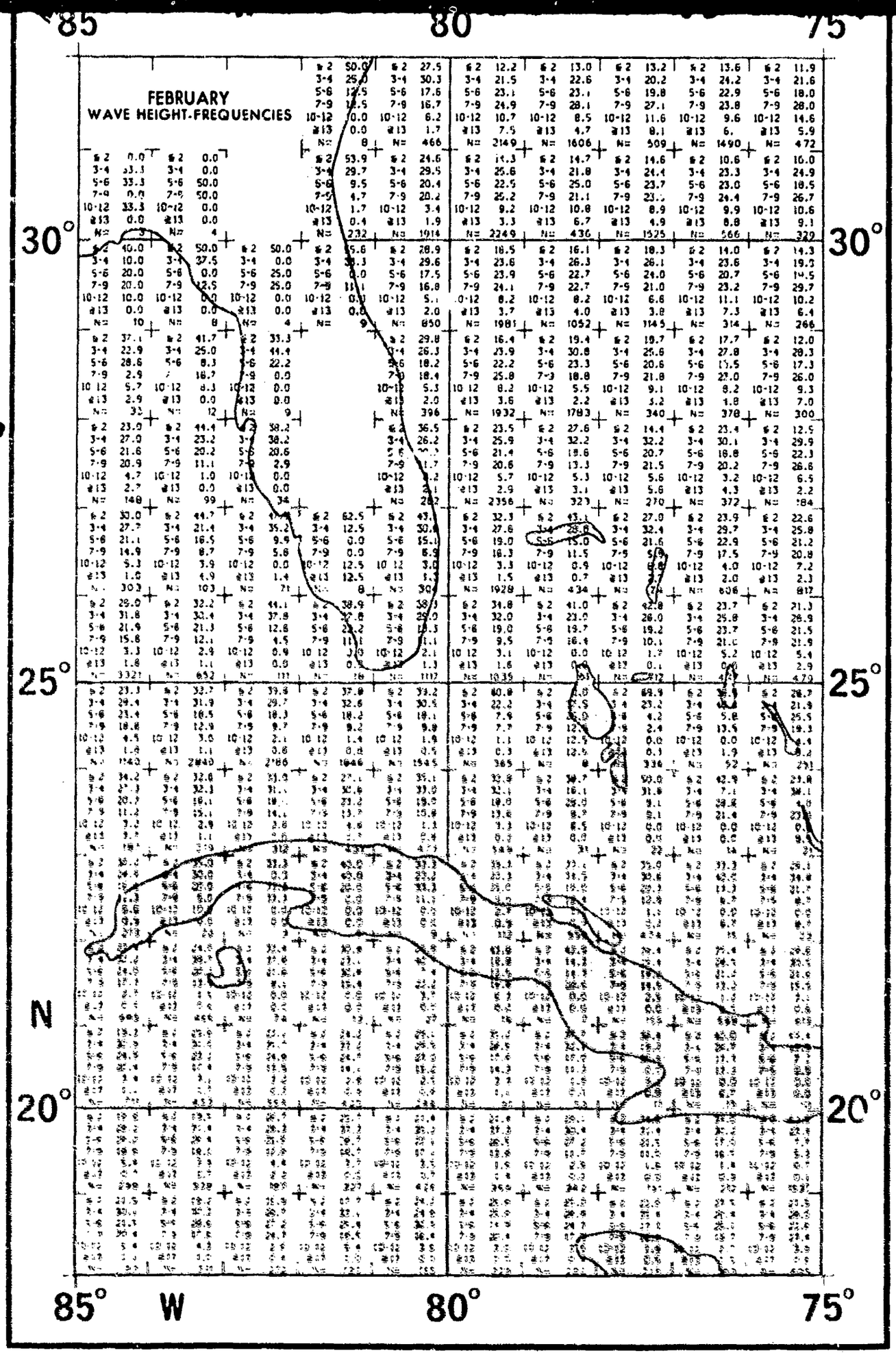

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
FEBRUARY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED 11-21 KNOTS
DASHED LINE -
WIND SPEED 22-33 KNOTS
10
15
20
40
50
5

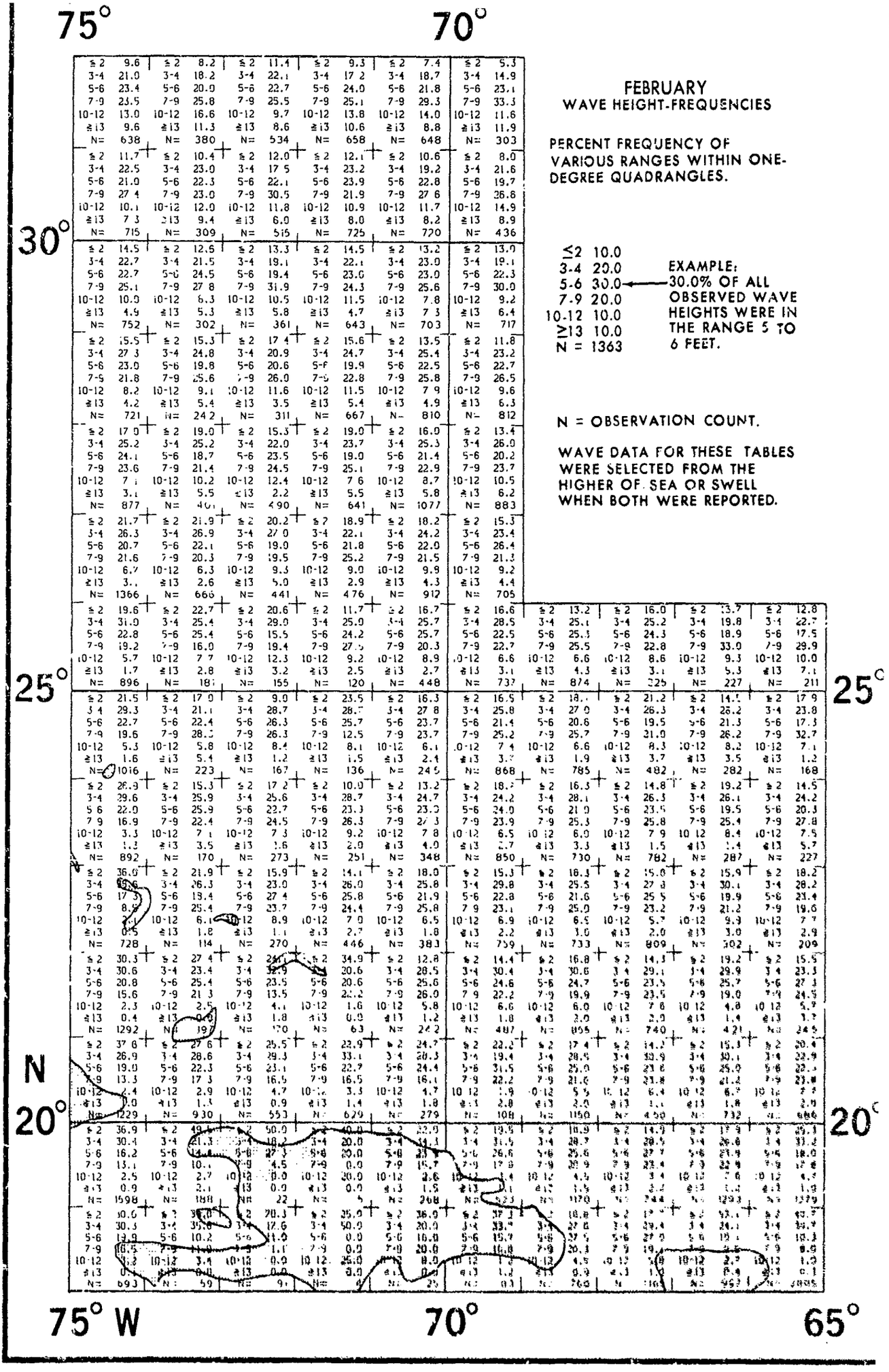

FEBRUARY
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
W


75°
70°
30°
25°
20°
N
75° W
70°
65°
FEBRUARY
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
FEBRUARY
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)


FEBRUARY
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEET
DASHED LINE -
WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS.
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°


FEBRUARY
WAVE HEIGHT-FREQUENCIES
85°
80°
75°
30°
25°
20°
N
W



FEBRUARY
WAVE HEIGHT-FREQUENCIES

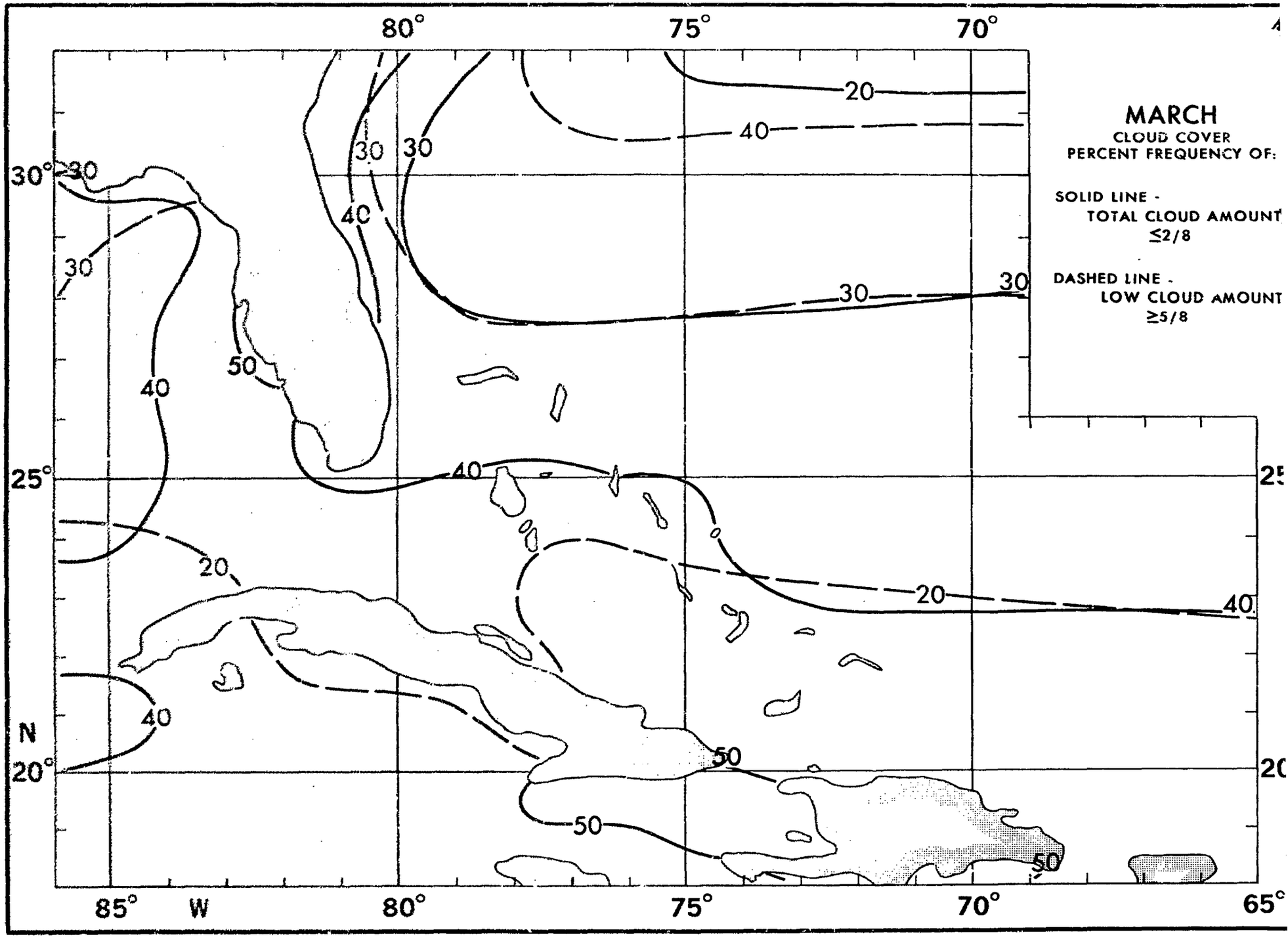
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

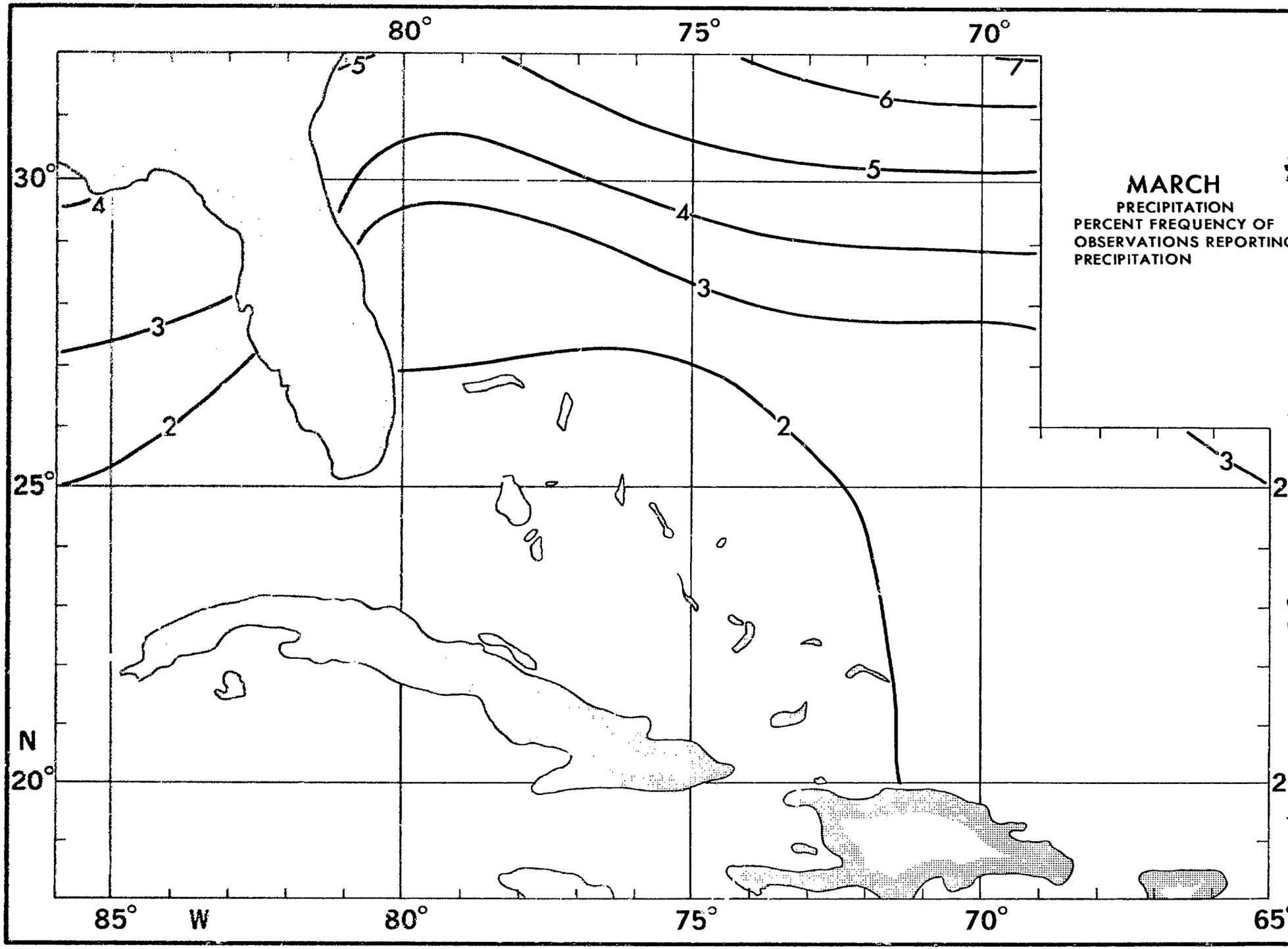
≤2	10.0
3-4	20.0
5-6	30.0
7-9	20.0
10-12	10.0
≥13	10.0
N =	1363

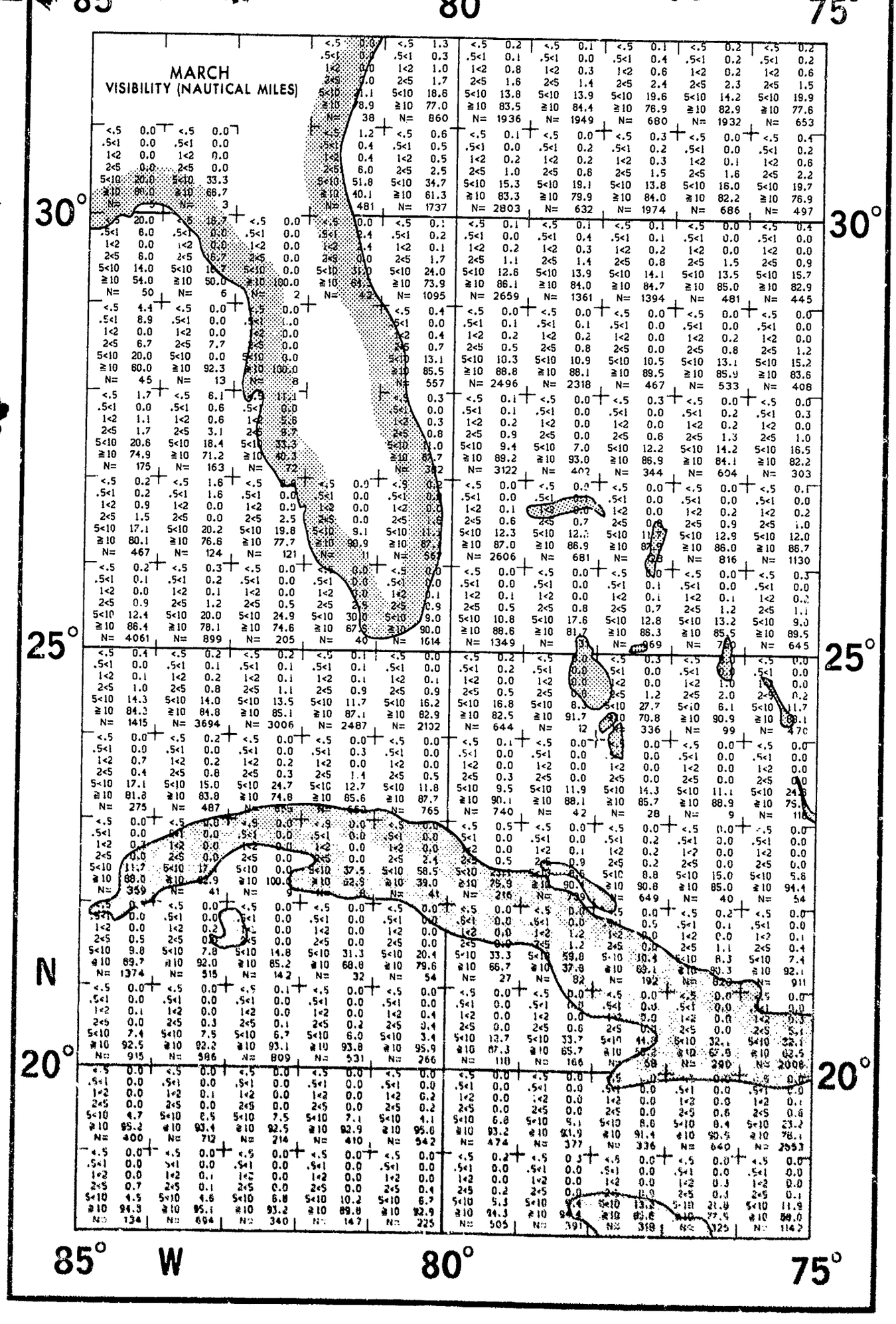
EXAMPLE: 30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.

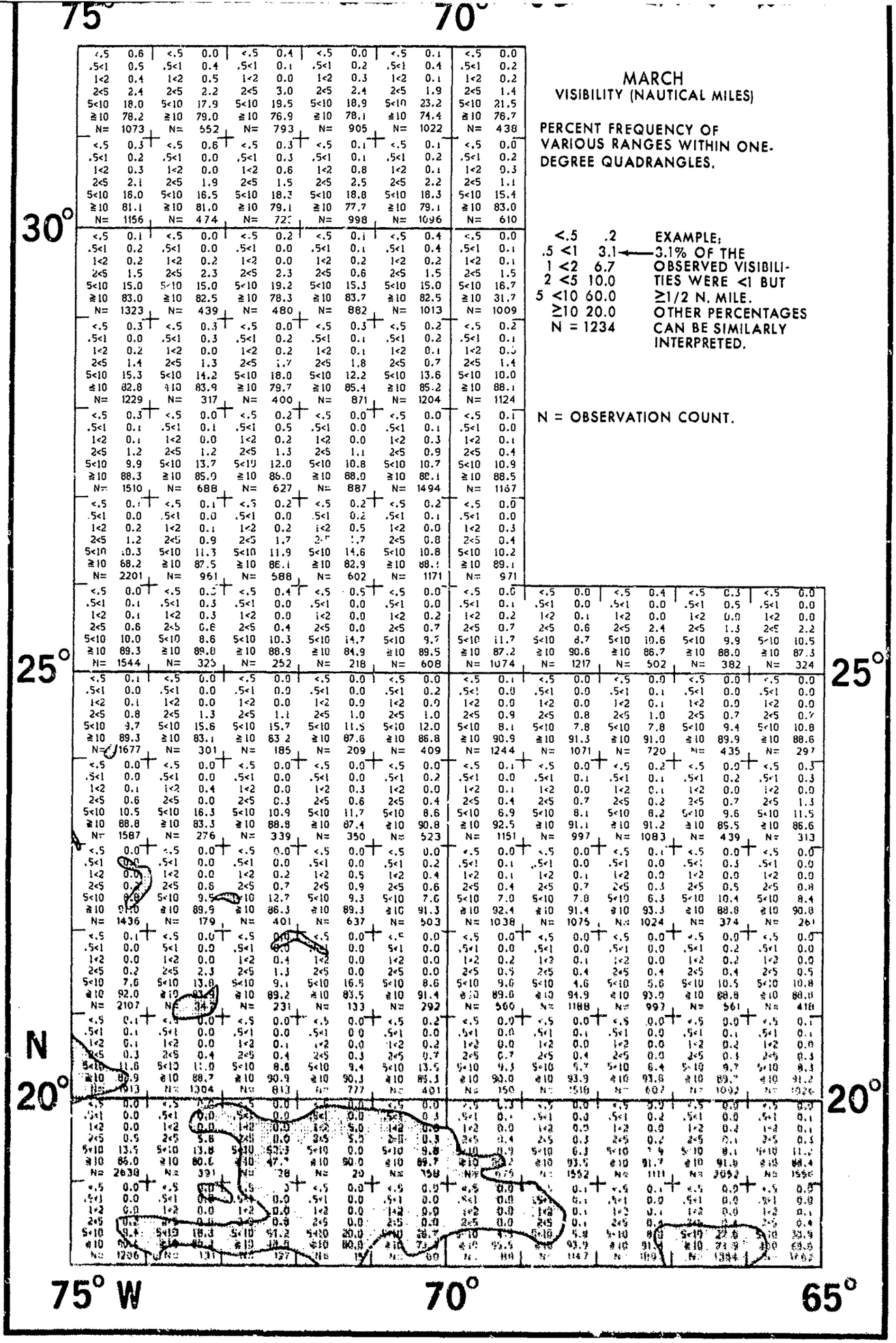
N = OBSERVATION COUNT.

WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


80°
75°
70°
MARCH
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/8
30°
25°
N
20°
85° W
80°
75°
70°
65°


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
7
6
5
4
3
2
MARCH
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION


MARCH
VISIBILITY (NAUTICAL MILES)
85°
80°
75°
30°
25°
20°
N
W



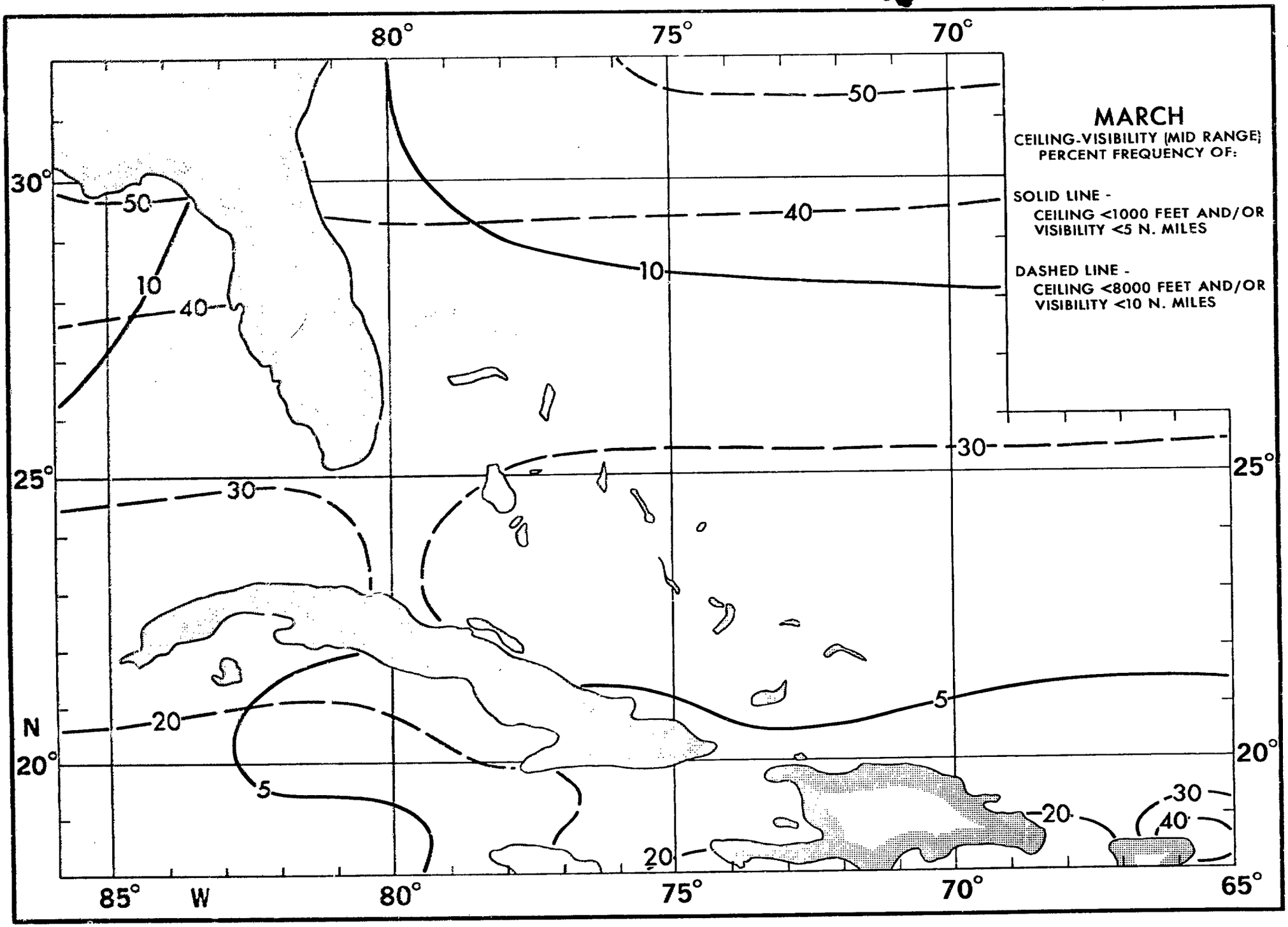
MARCH
VISIBILITY (NAUTICAL MILES)

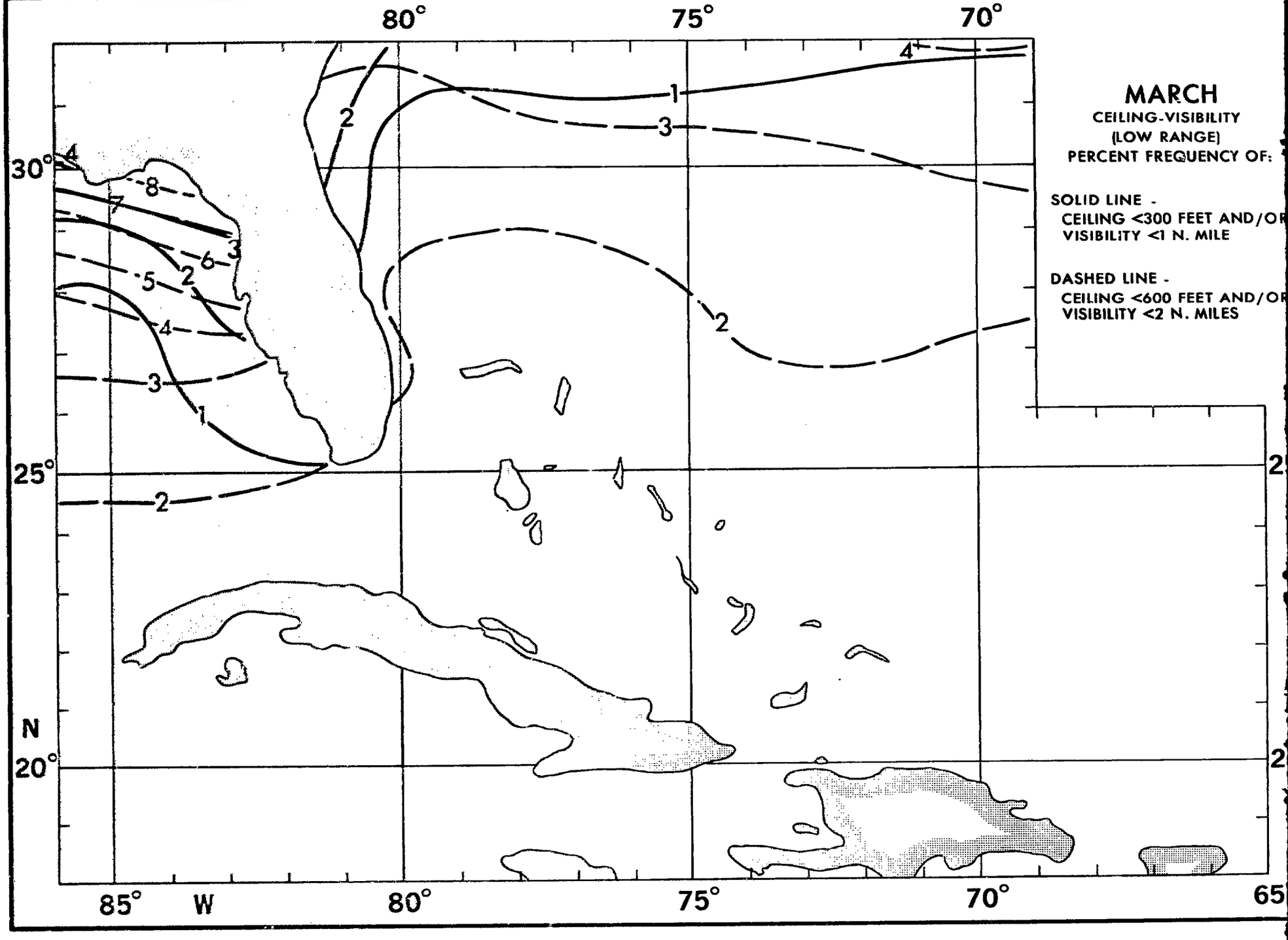
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

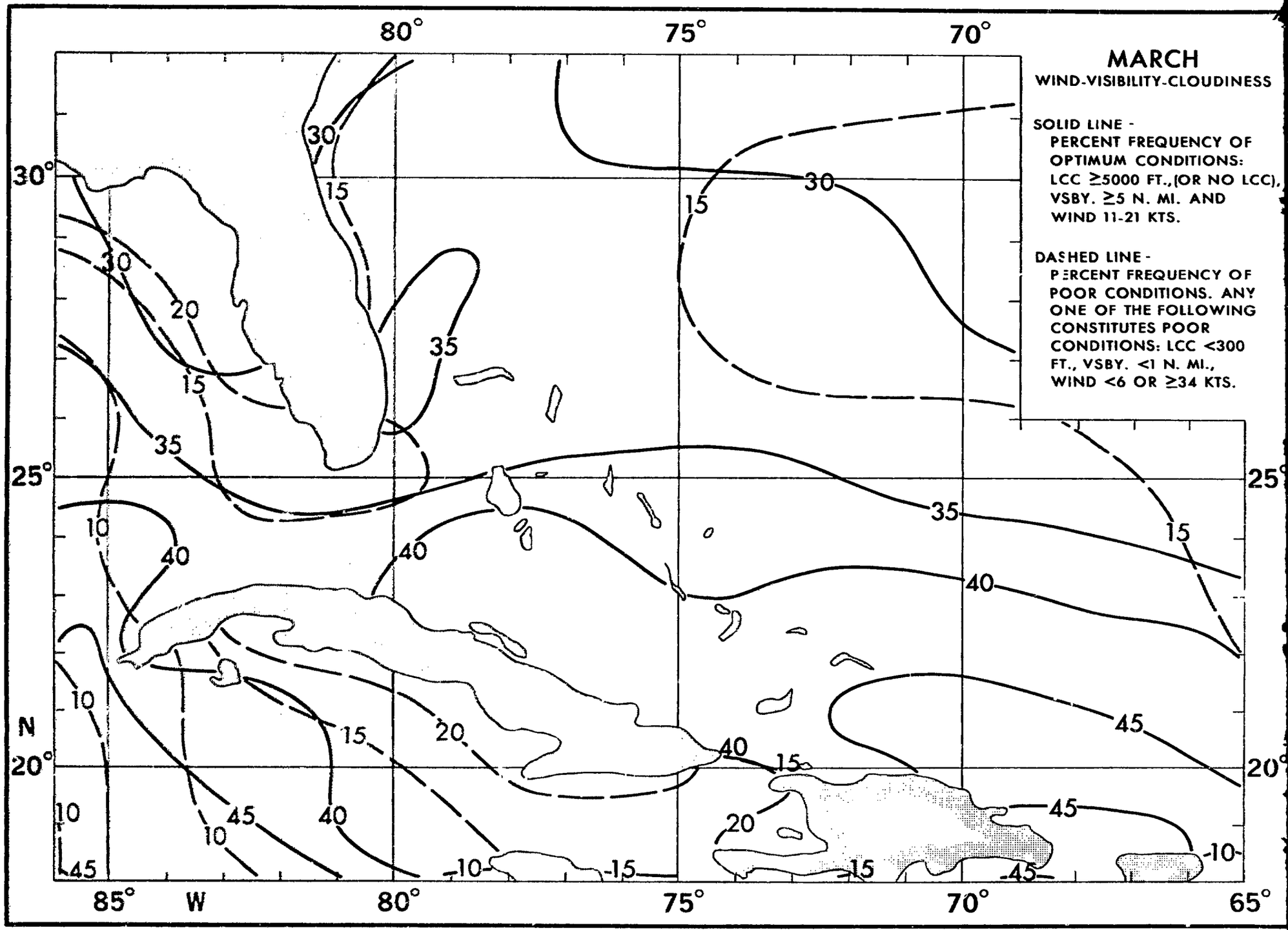
<.5	.2
.5 <1	3.1
1 <2	6.7
2 <5	10.0
5 <10	60.0
≥10	20.0
N =	1234

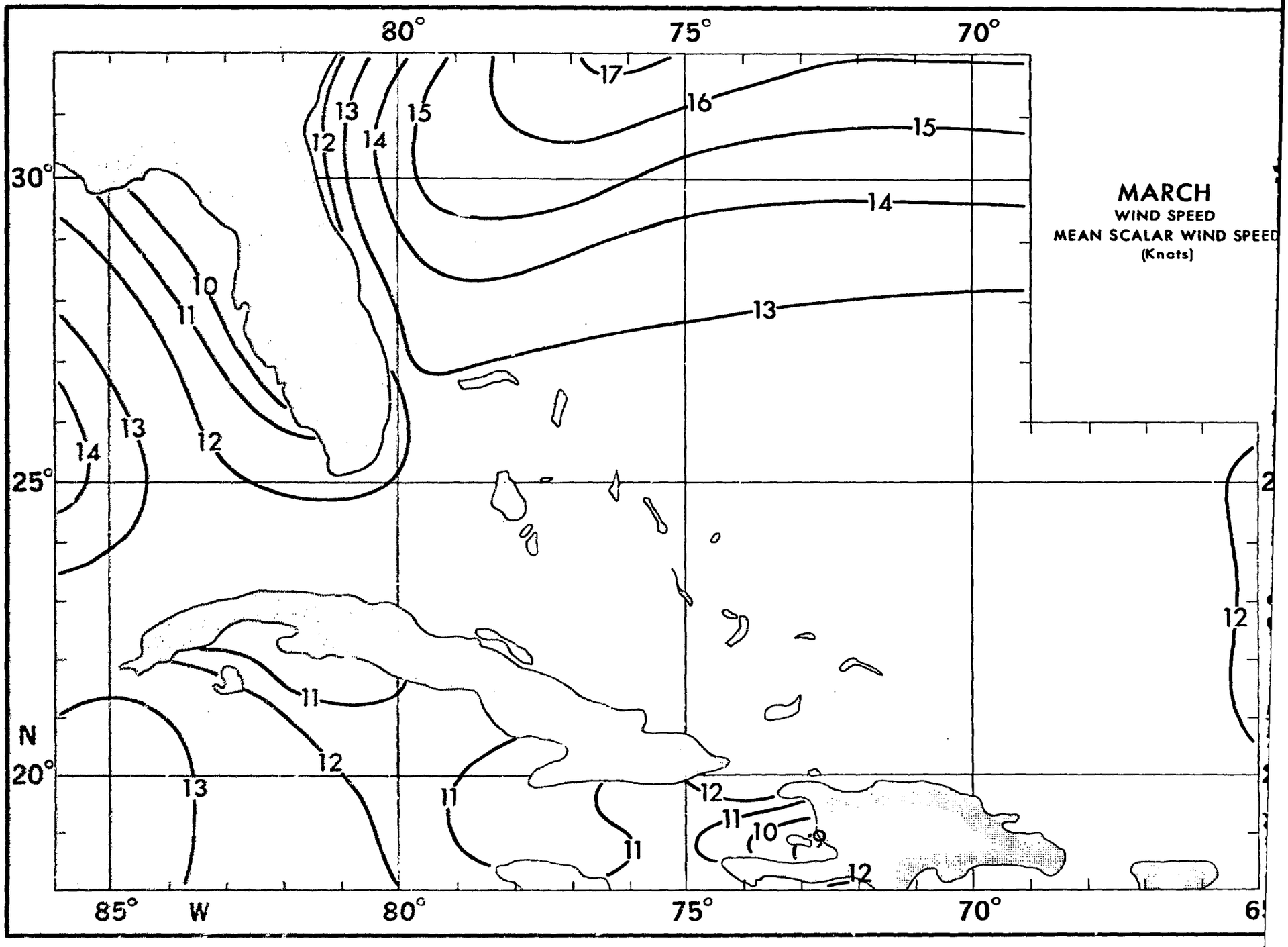
EXAMPLE: 3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE. OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.

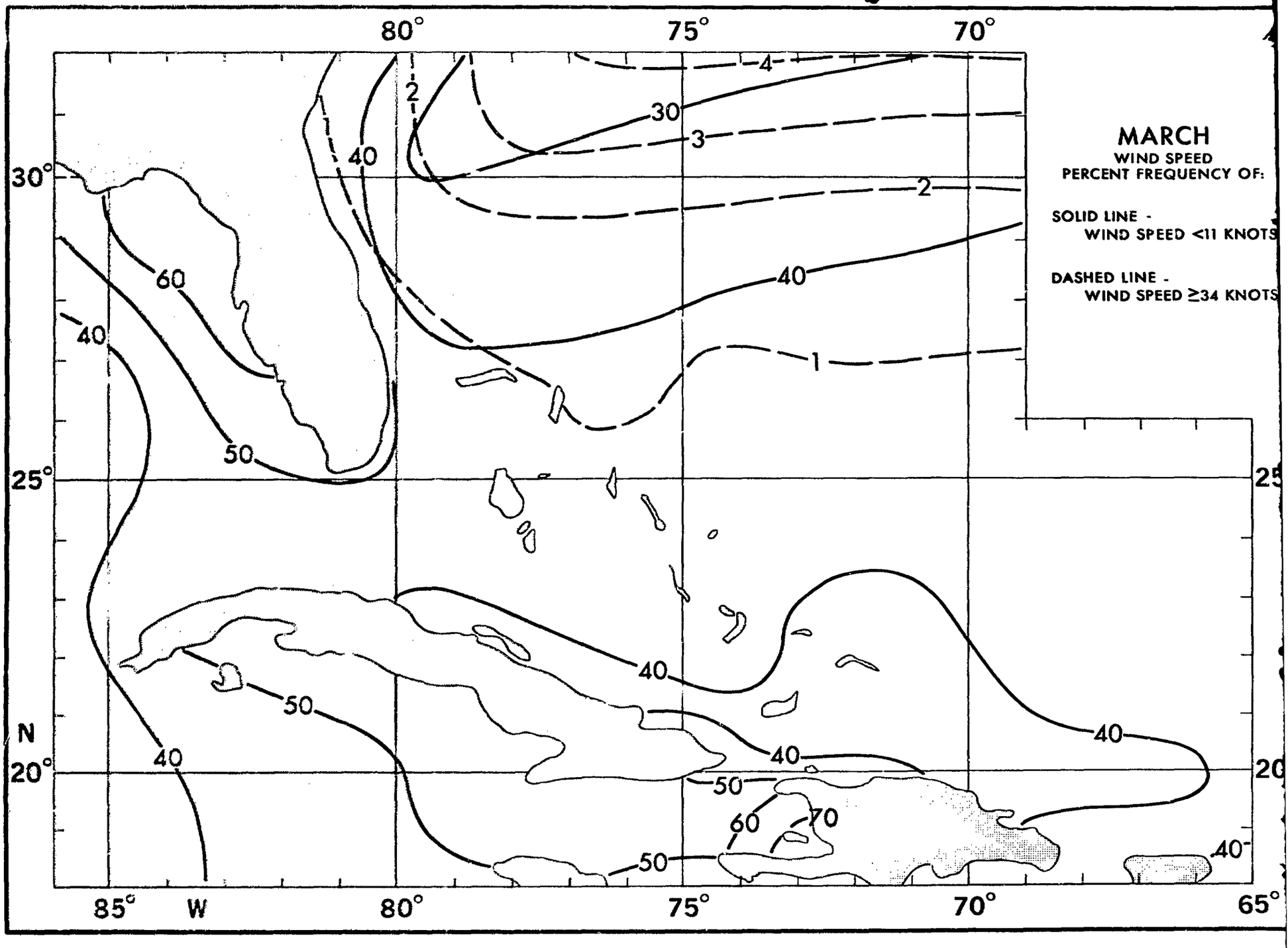
N = OBSERVATION COUNT.

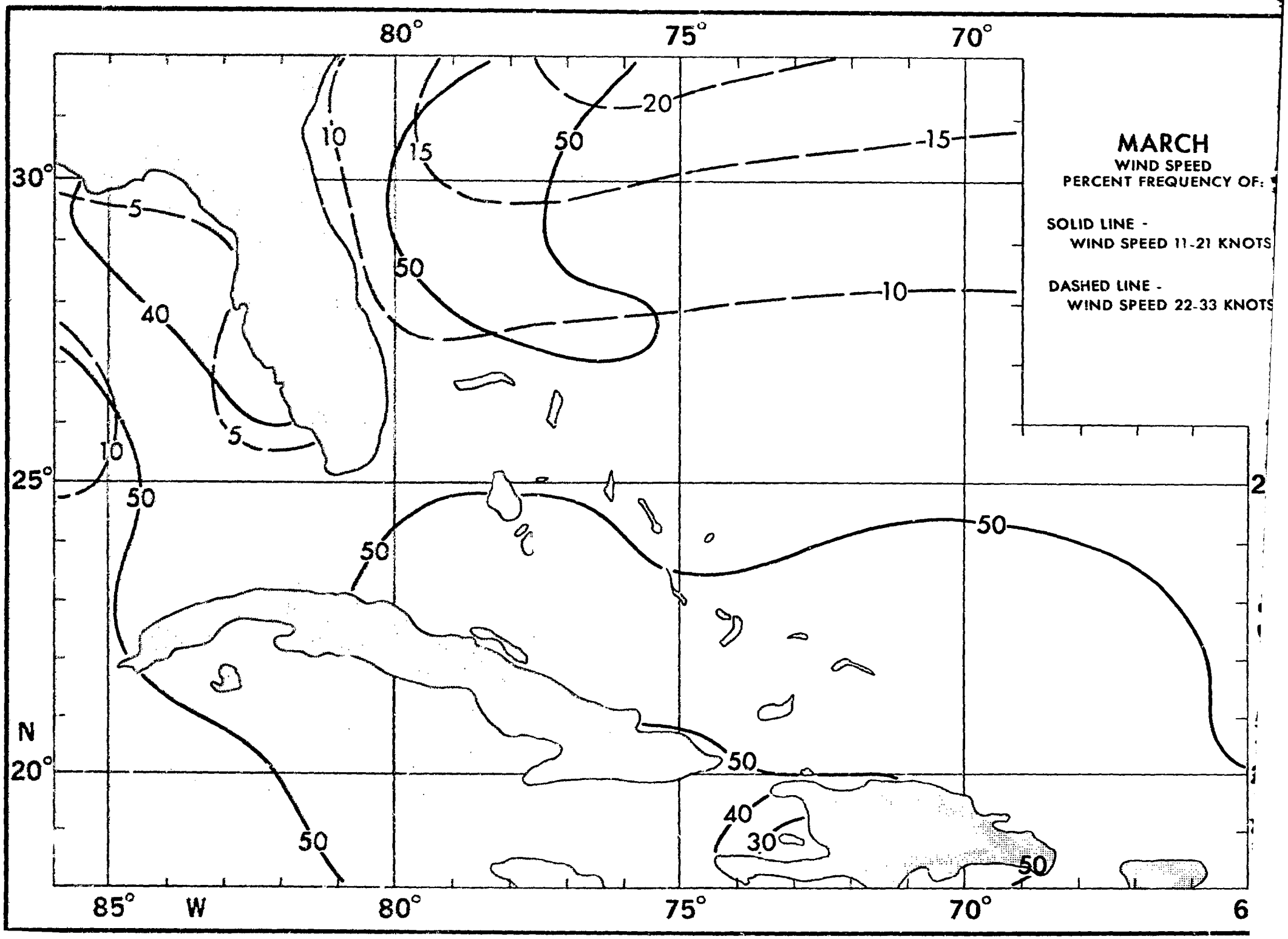

MARCH
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
50
40
10
30
20
5

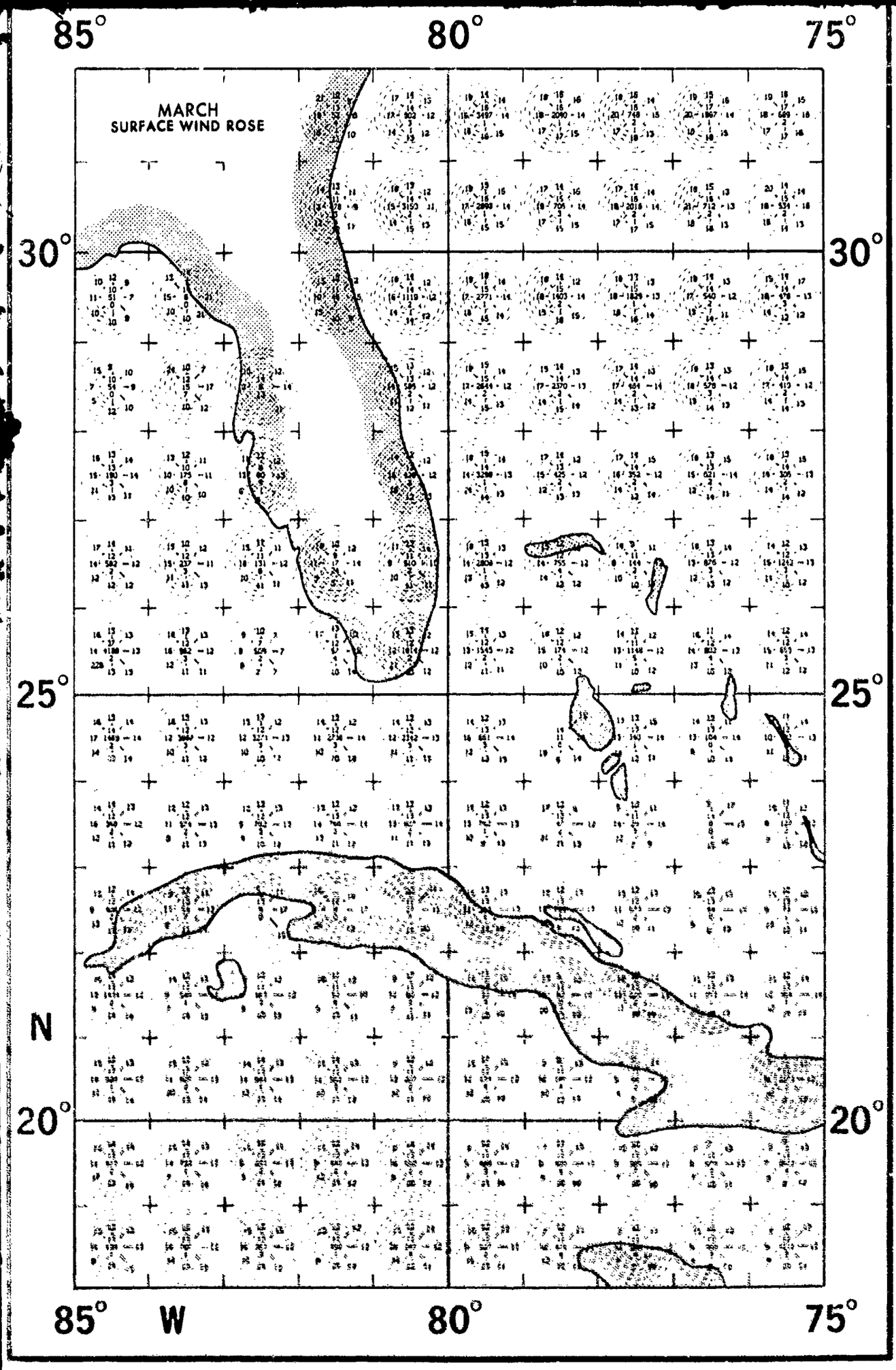

MARCH
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE -
CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65

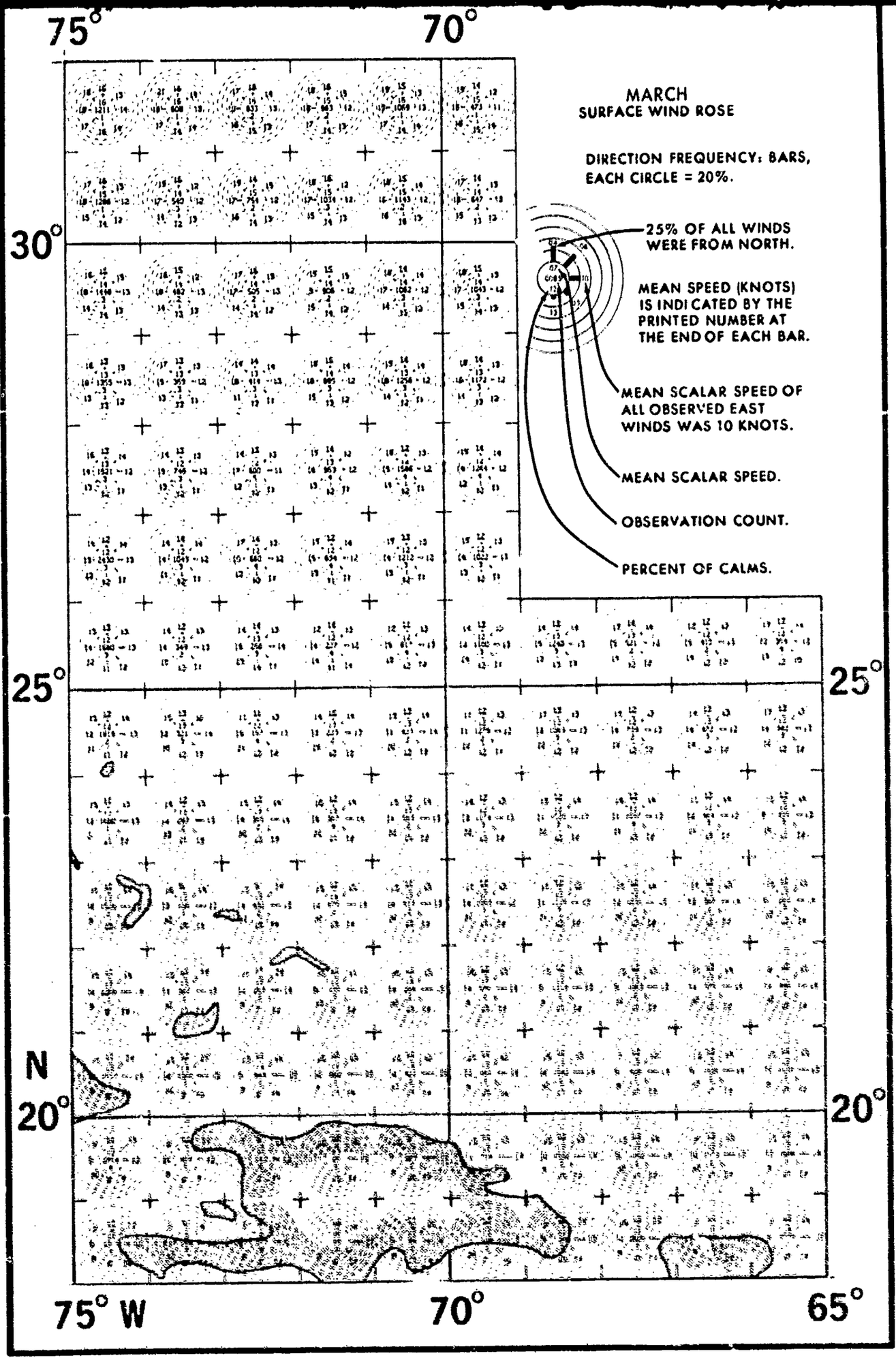

MARCH
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
80° 75° 70°
30° 25° N 20°
85° W 80° 75° 70° 65°

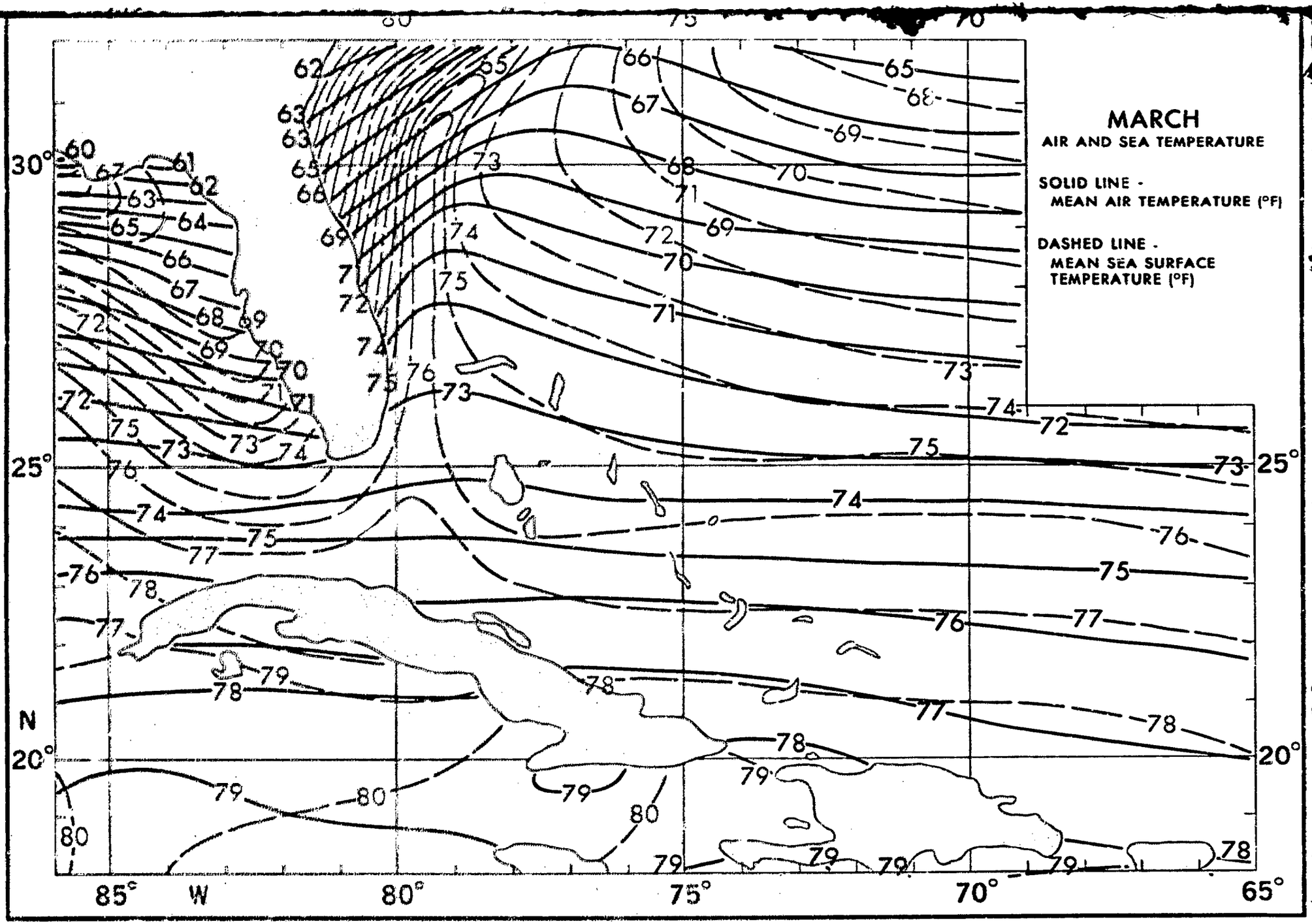

80°
75°
70°
30°
25°
N
20°
85°
W
80°
75°
70°
MARCH
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)
17
16
15
14
13
12
11
10
9

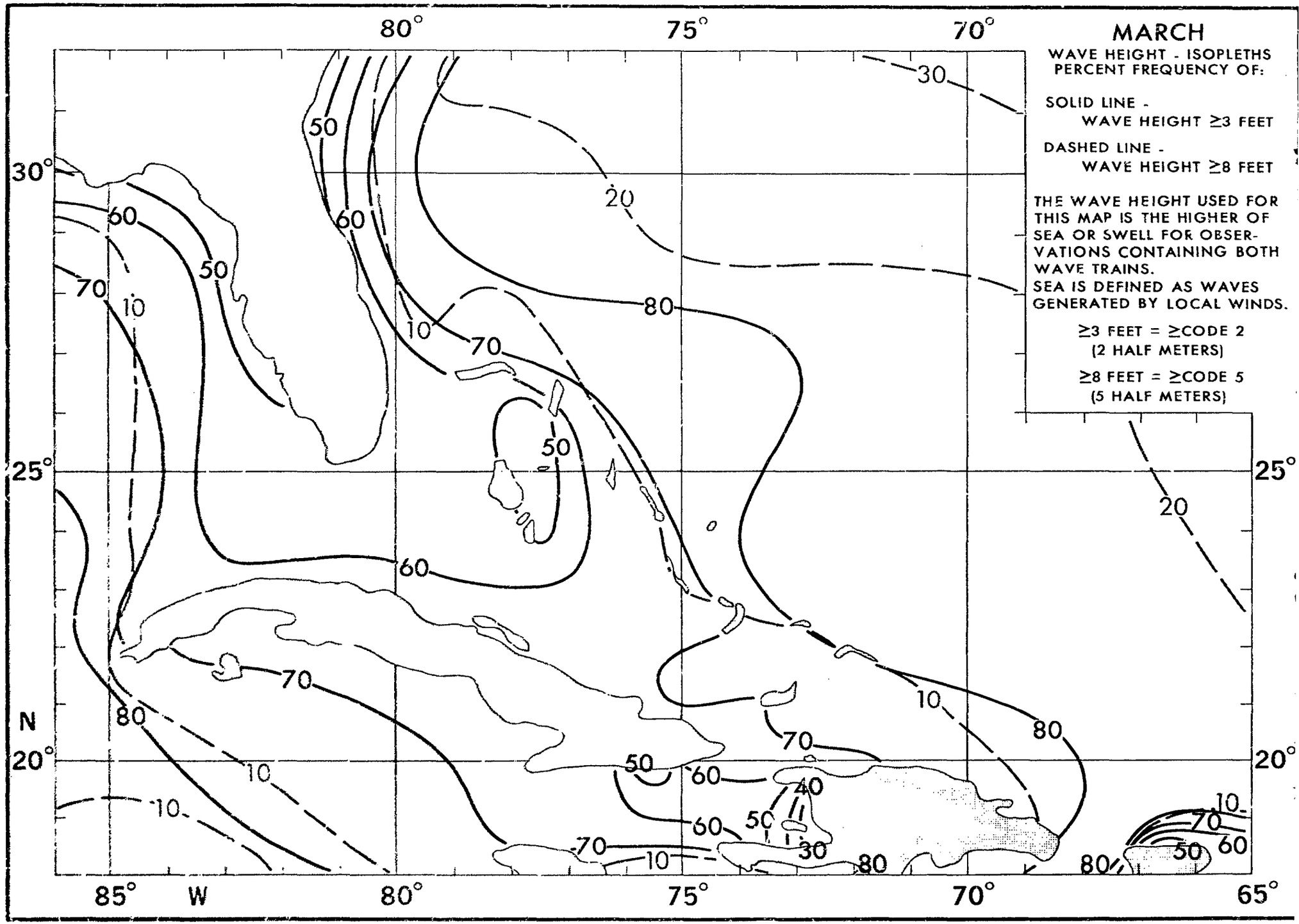

80°
75°
70°
30°
25°
N
20°
85°
W
80°
75°
70°
65°
MARCH
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS
4
30
3
2
40
2
1
60
40
50
40
50
40
40
40
50
60
70
50
40

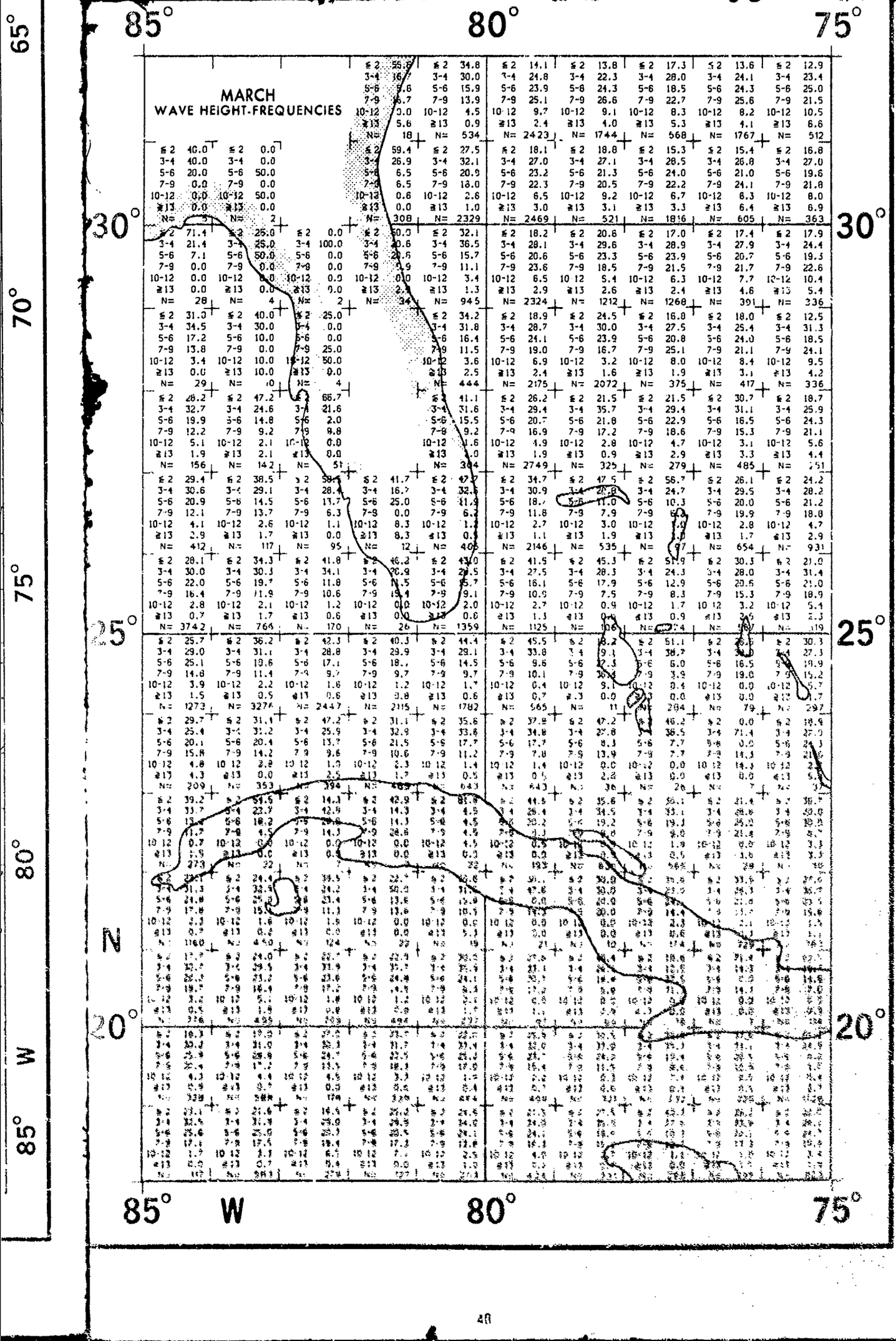

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
MARCH
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED 11-21 KNOTS
DASHED LINE -
WIND SPEED 22-33 KNOTS
5
10
15
20
40
50
30

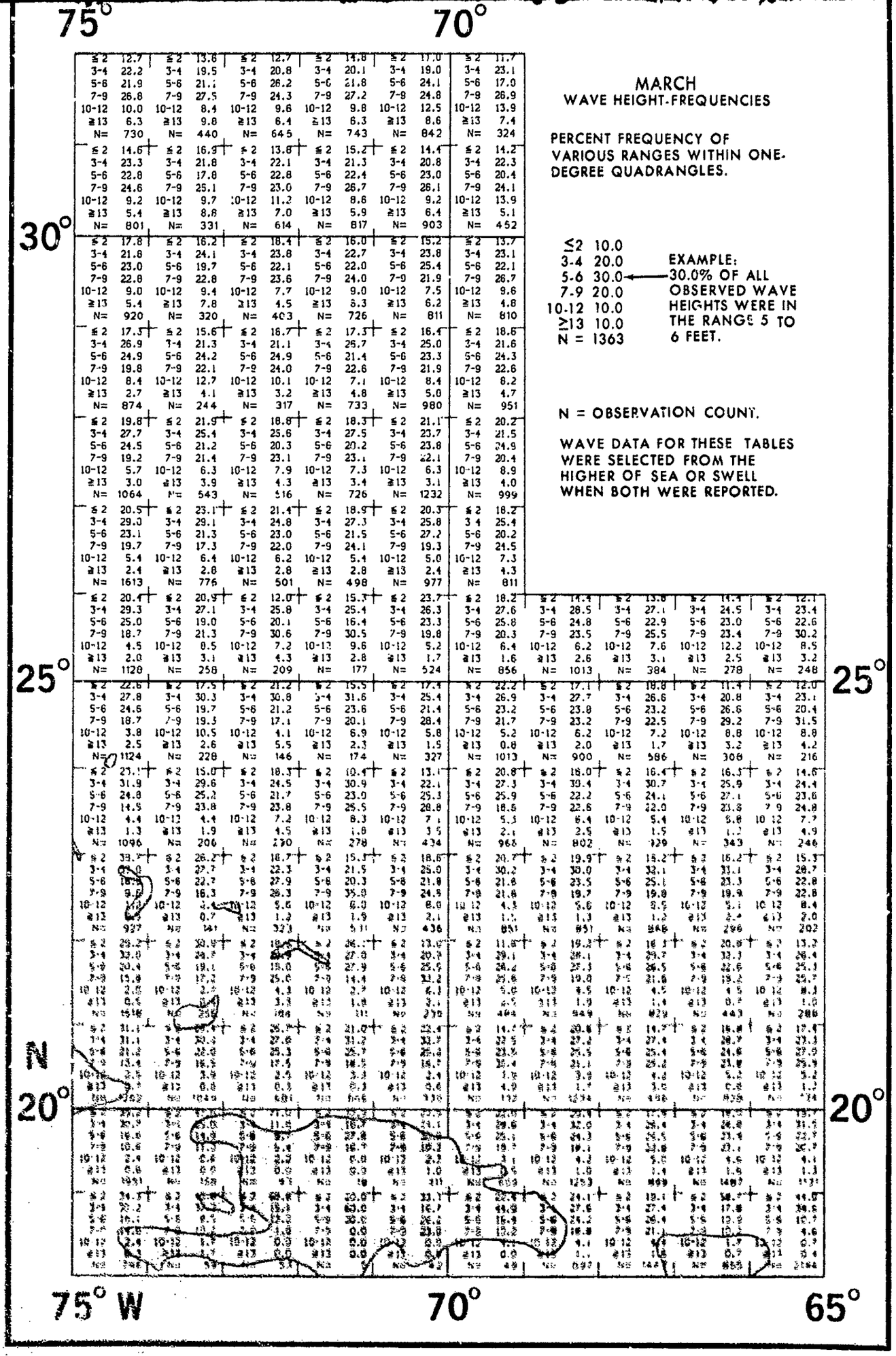

MARCH
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
W


75°
70°
30°
25°
20°
N
75° W
70°
65°
MARCH
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


MARCH
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)
30°
25°
20°
N
85° W
80°
75°
70°
65°


MARCH
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEET
DASHED LINE -
WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS.
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°


MARCH
WAVE HEIGHT-FREQUENCIES
85°
80°
75°
65°
70°
75°
80°
85° W
30°
25°
20°
N



MARCH
WAVE HEIGHT-FREQUENCIES

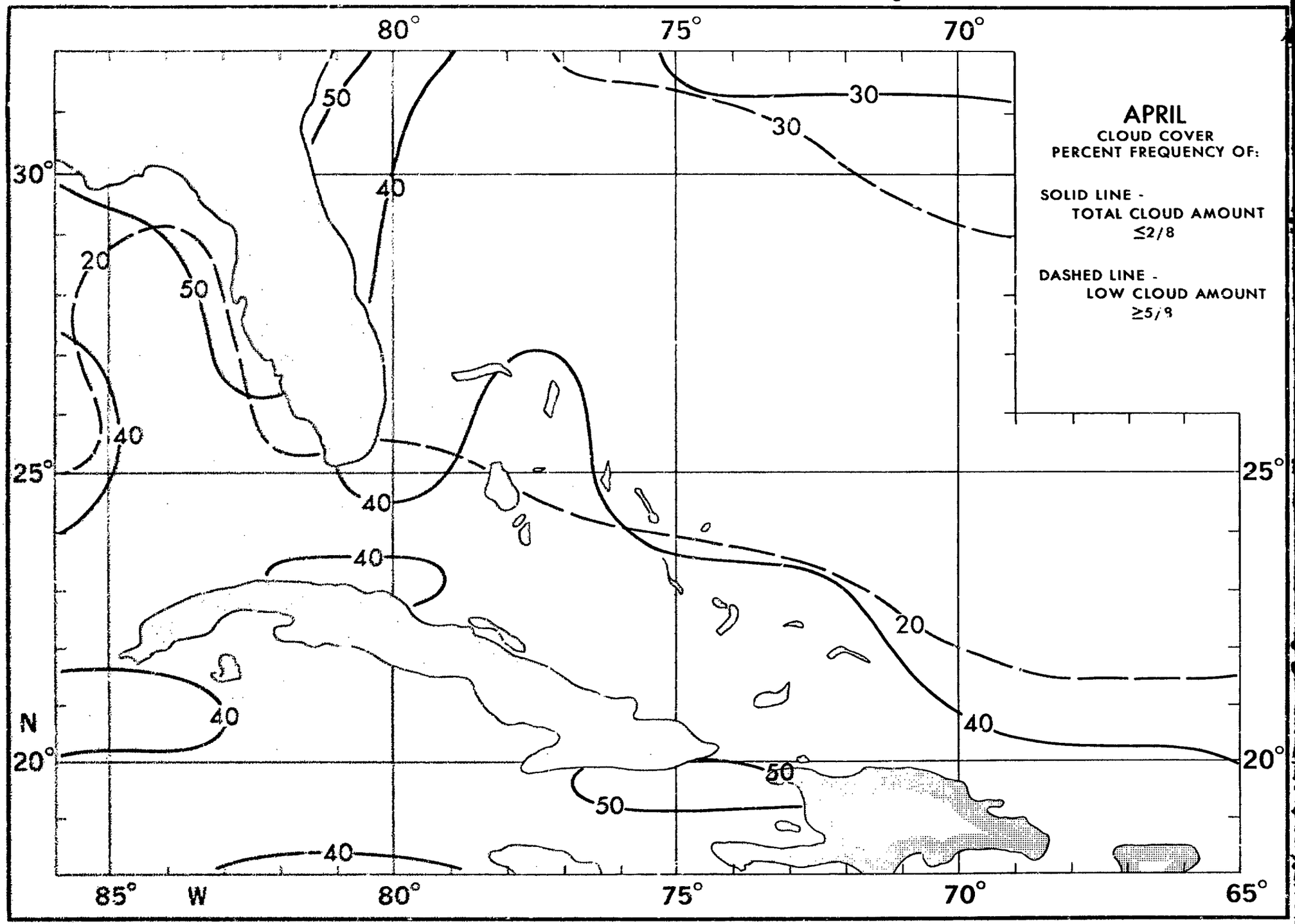
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

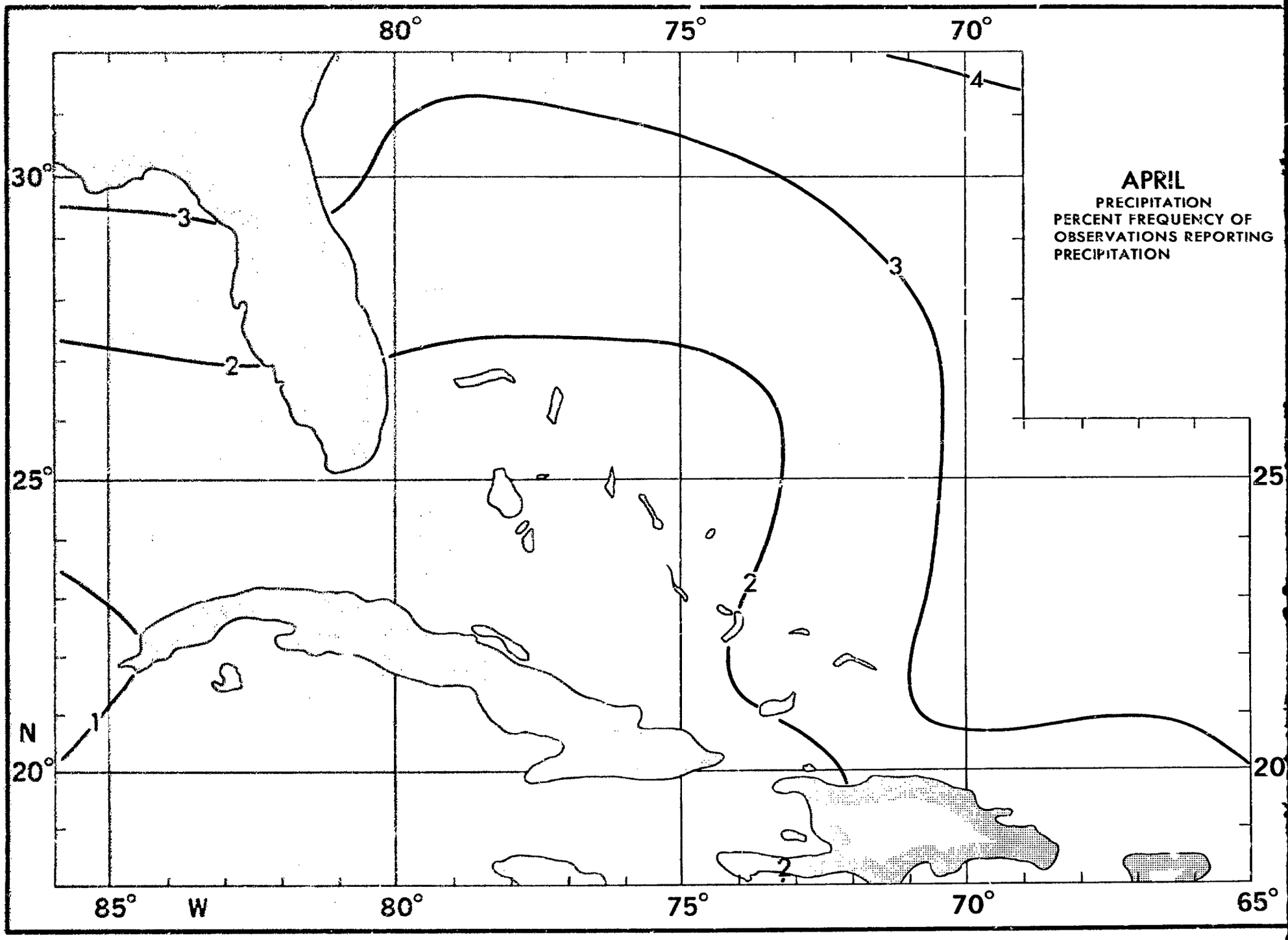
≤2	10.0
3-4	20.0
5-6	30.0
7-9	20.0
10-12	10.0
≥13	10.0
N =	1363

EXAMPLE: 30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.

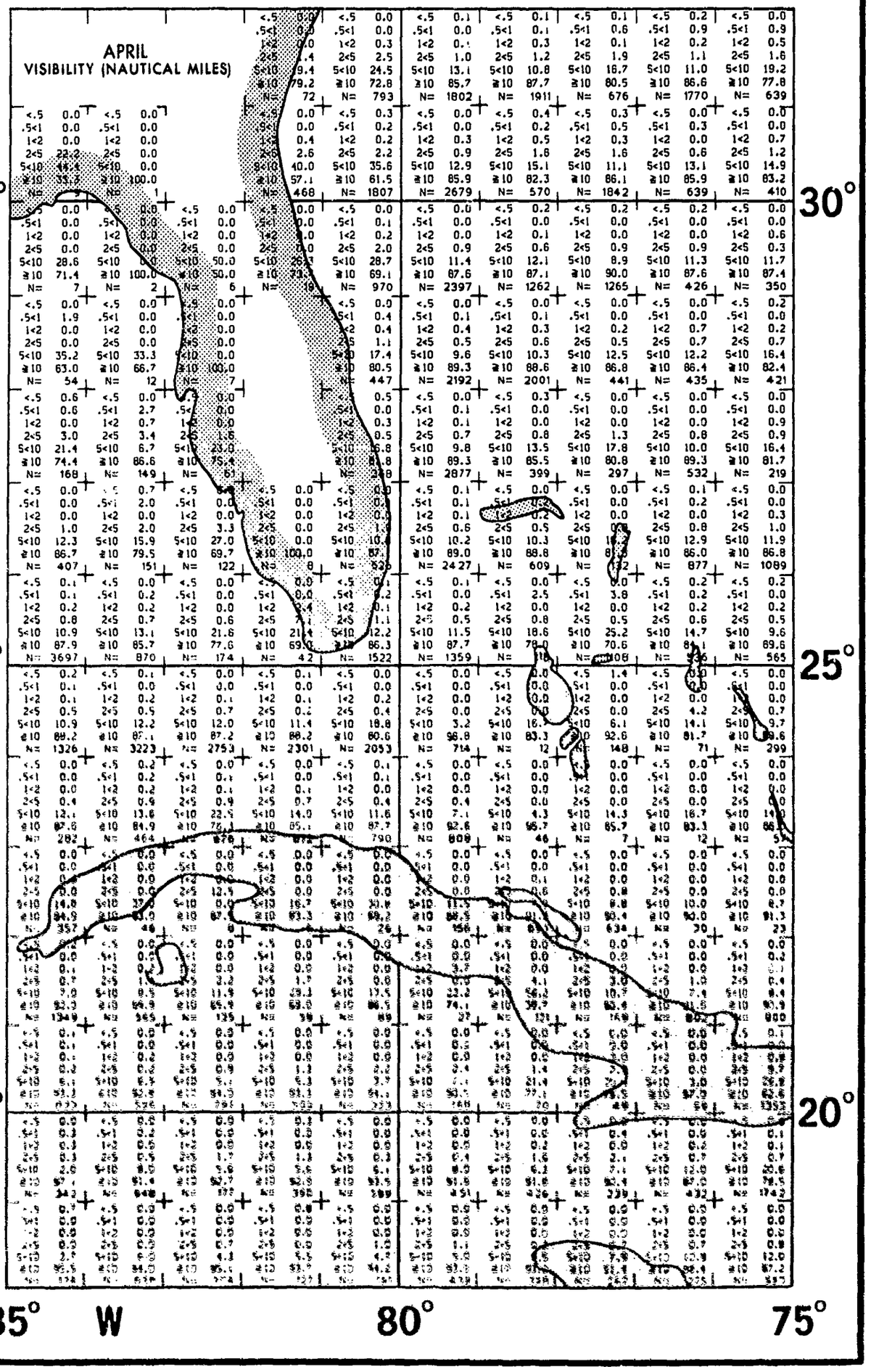
N = OBSERVATION COUNT.

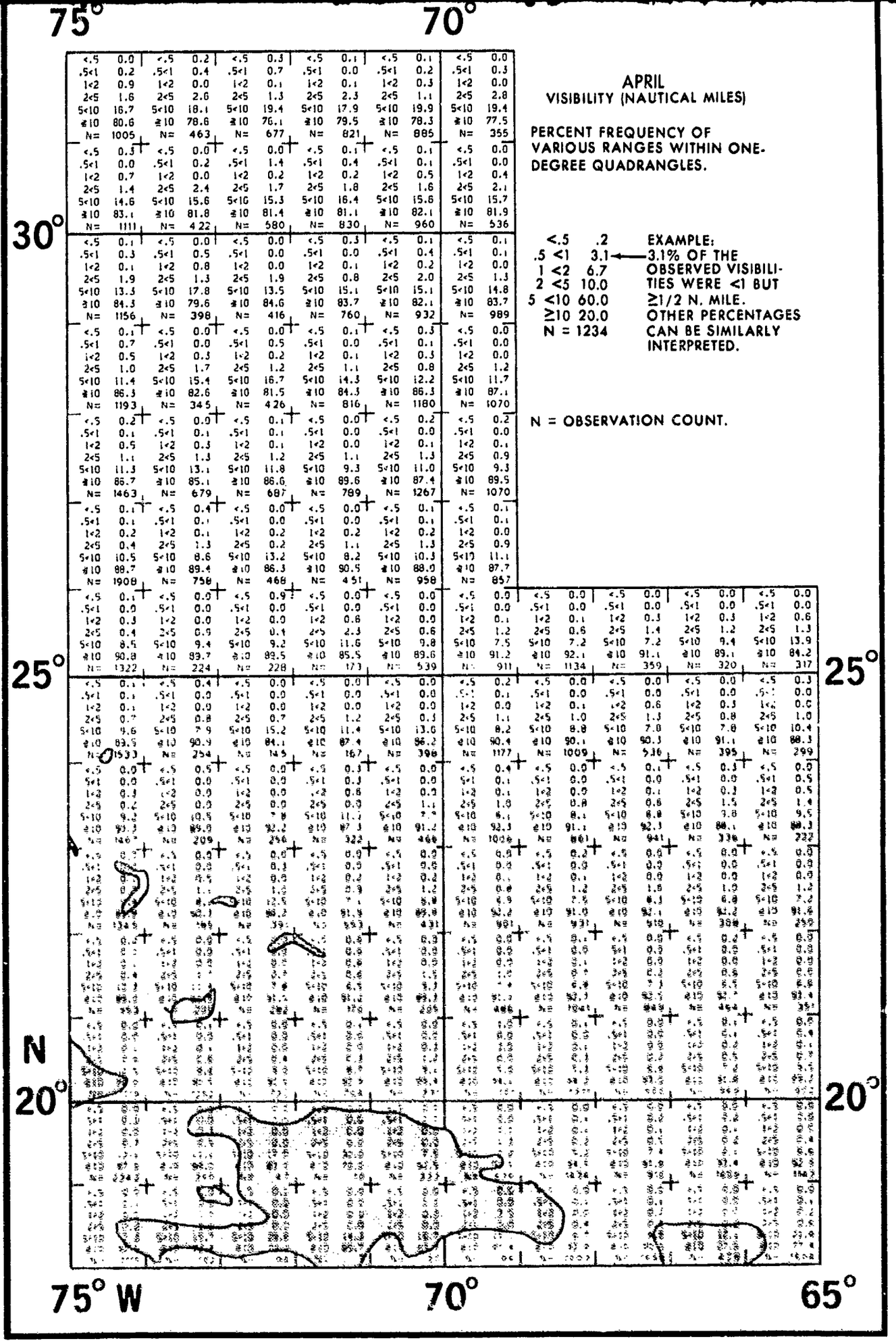
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
50
40
30
20
APRIL
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/9


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
APRIL
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION
1
2
3
4

APRIL
VISIBILITY (NAUTICAL MILES)





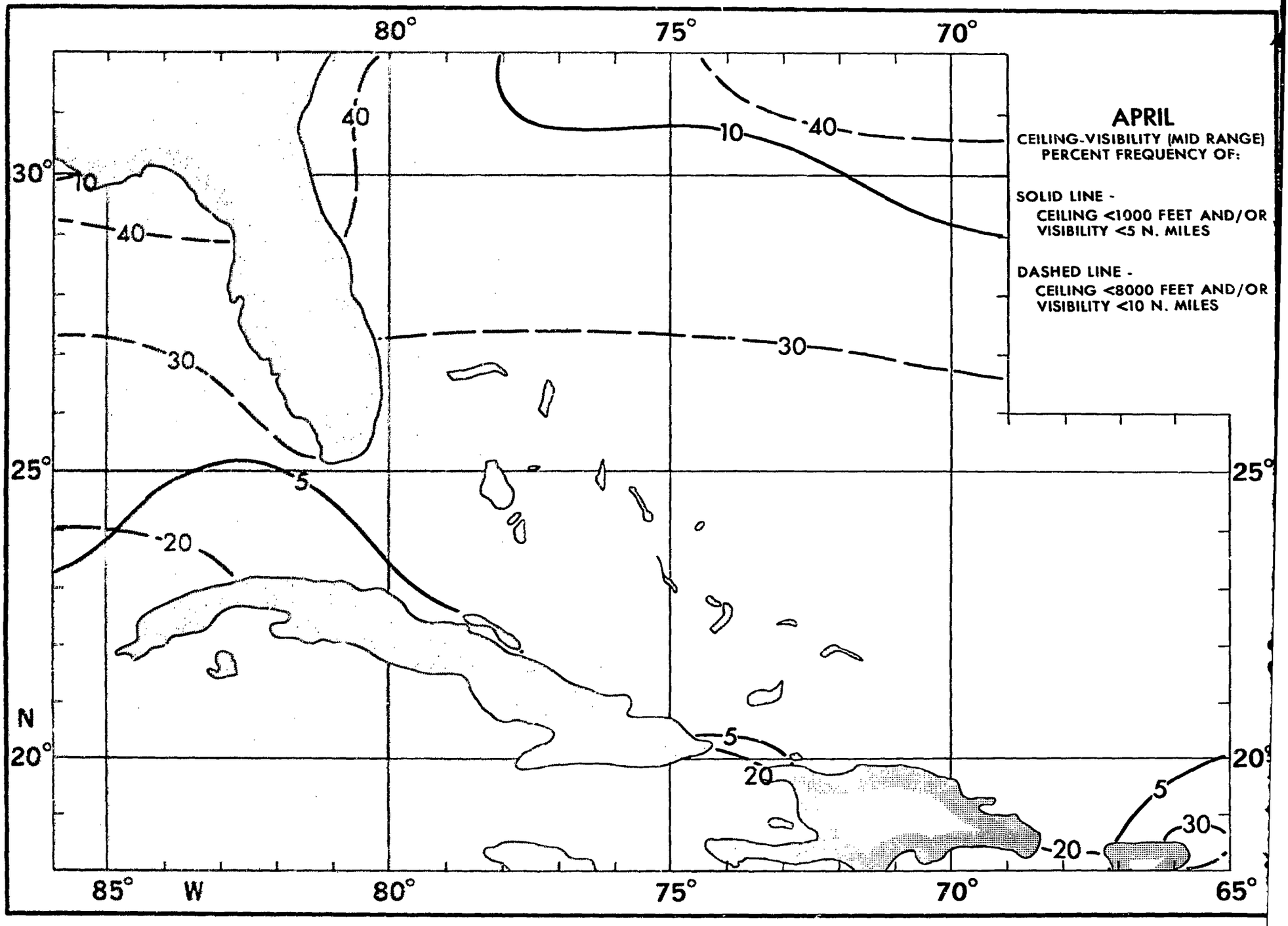
APRIL
VISIBILITY (NAUTICAL MILES)

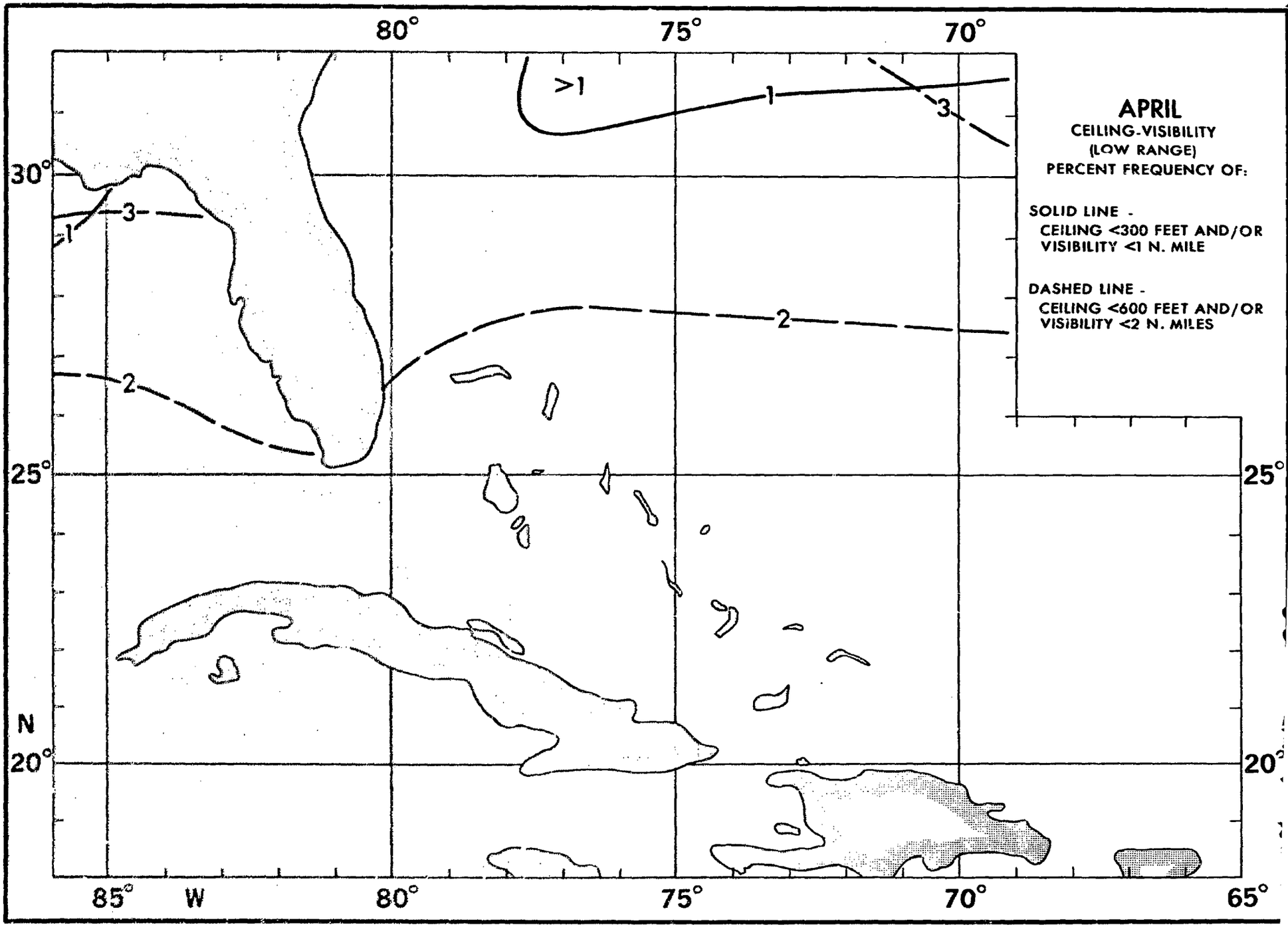
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

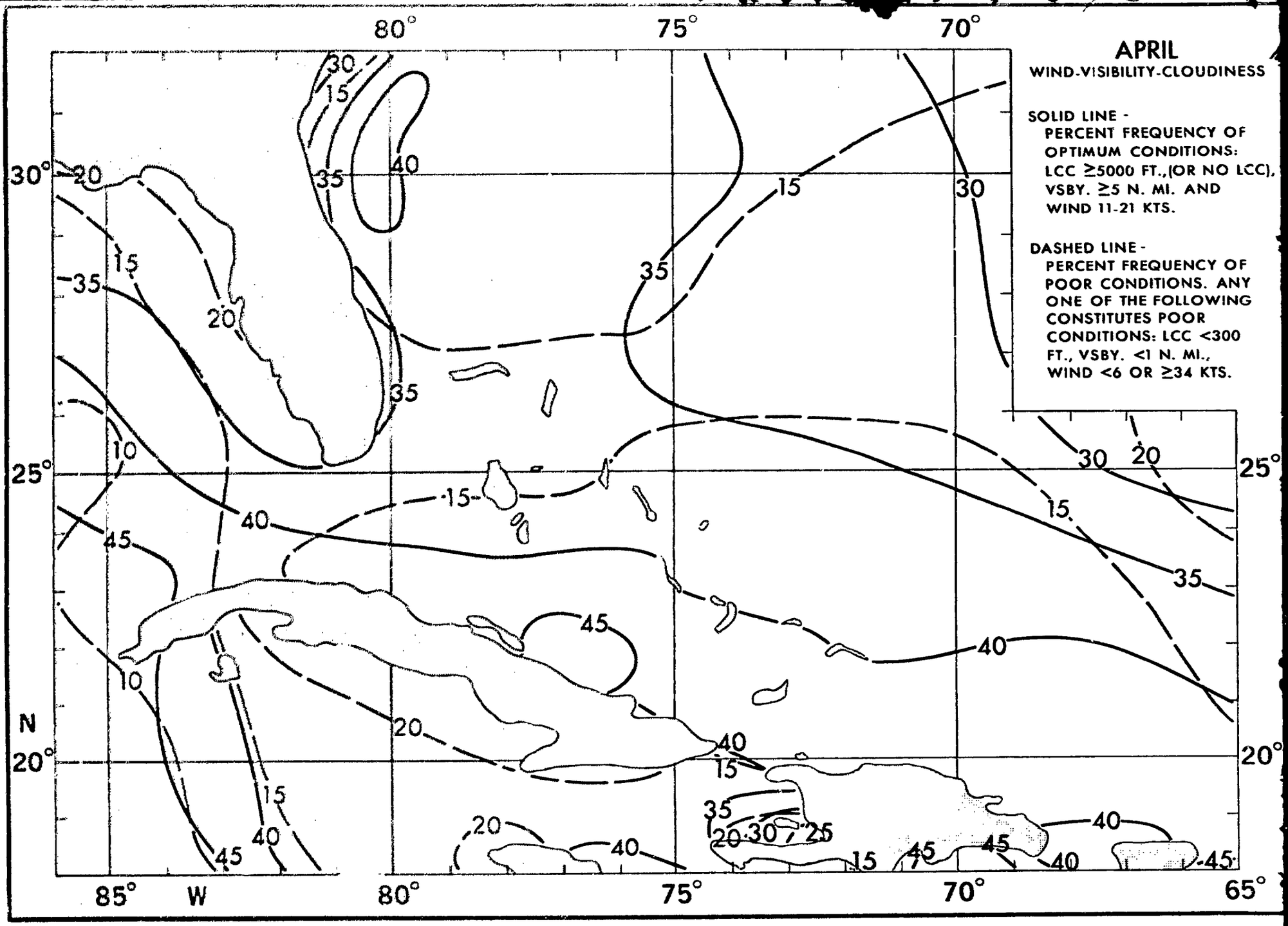
<.5	.2
.5 <1	3.1
1 <2	6.7
2 <5	10.0
5 <10	60.0
≥10	20.0
N =	1234

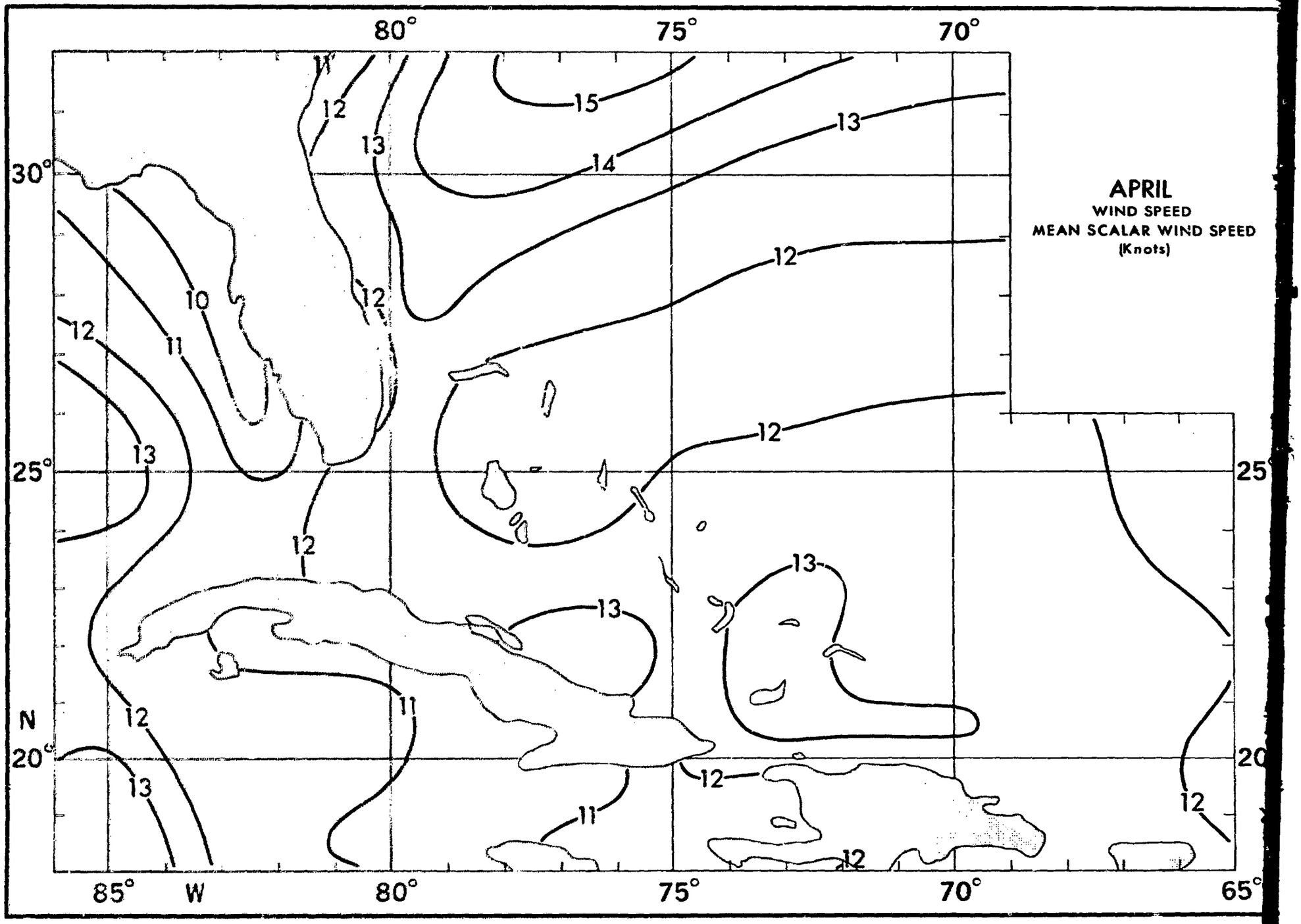
EXAMPLE:
3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE.
OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.

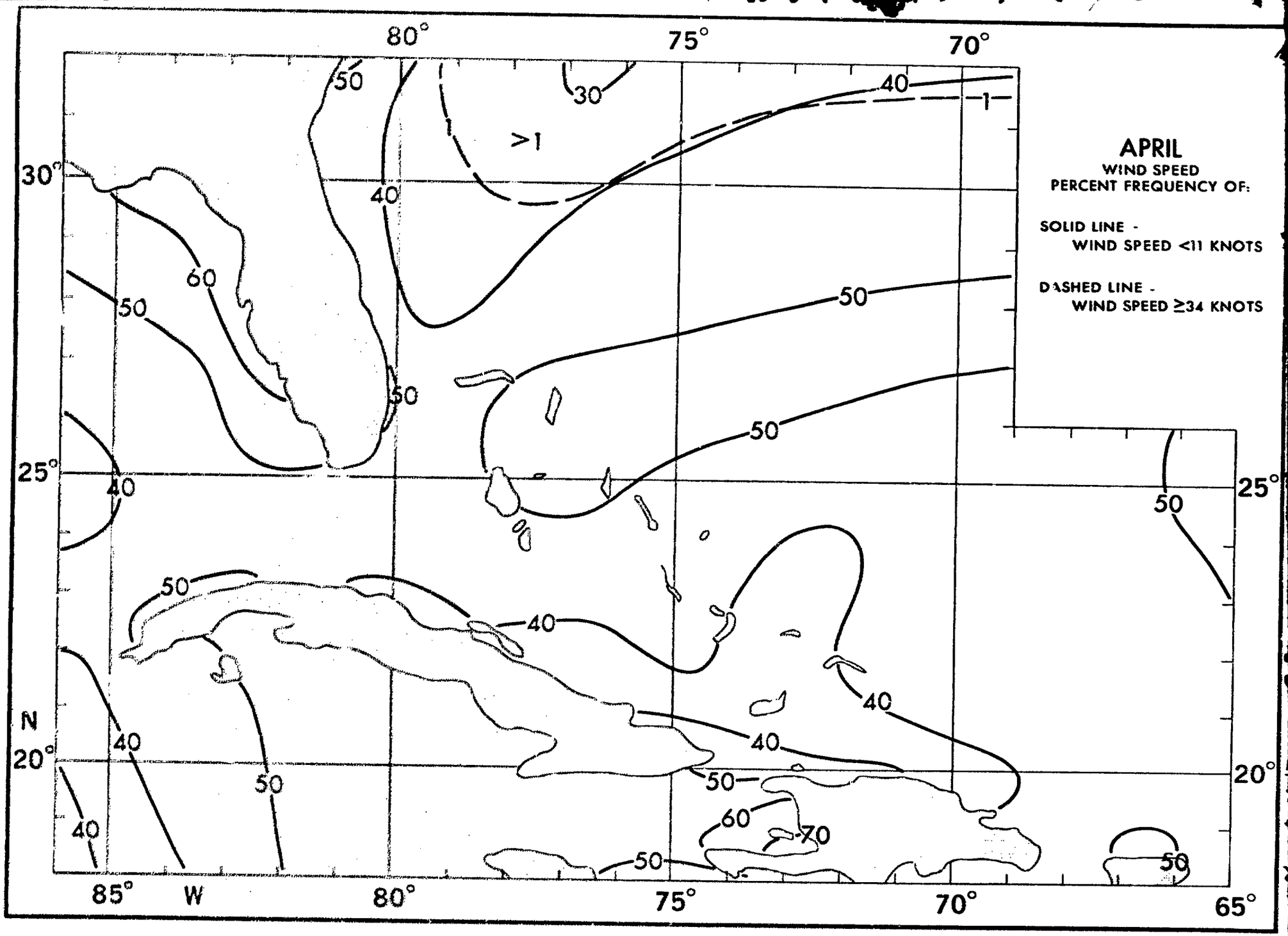
N = OBSERVATION COUNT.

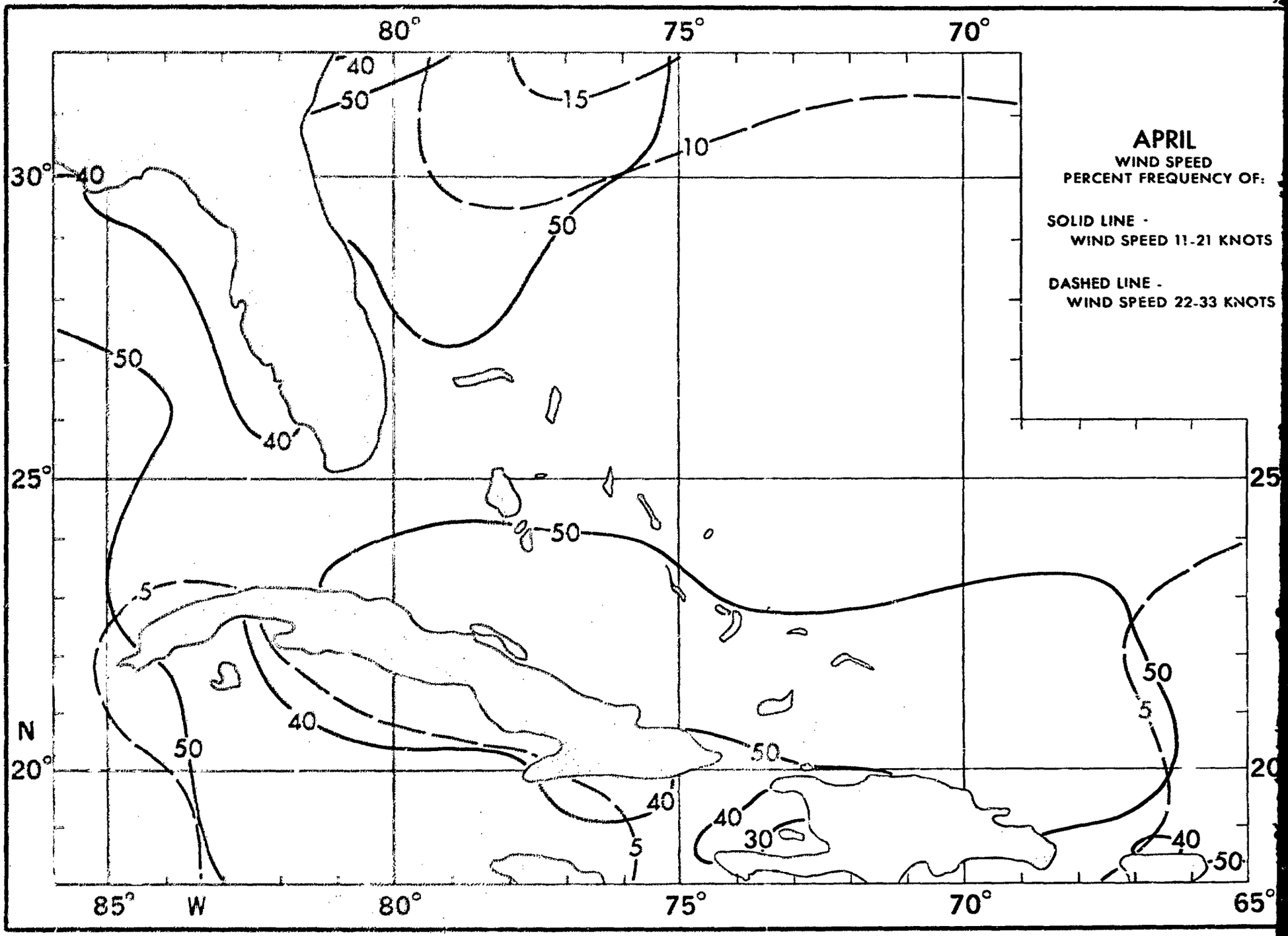

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
APRIL
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES
40
10
40
10
40
30
30
5
20
5
20
5
30
20

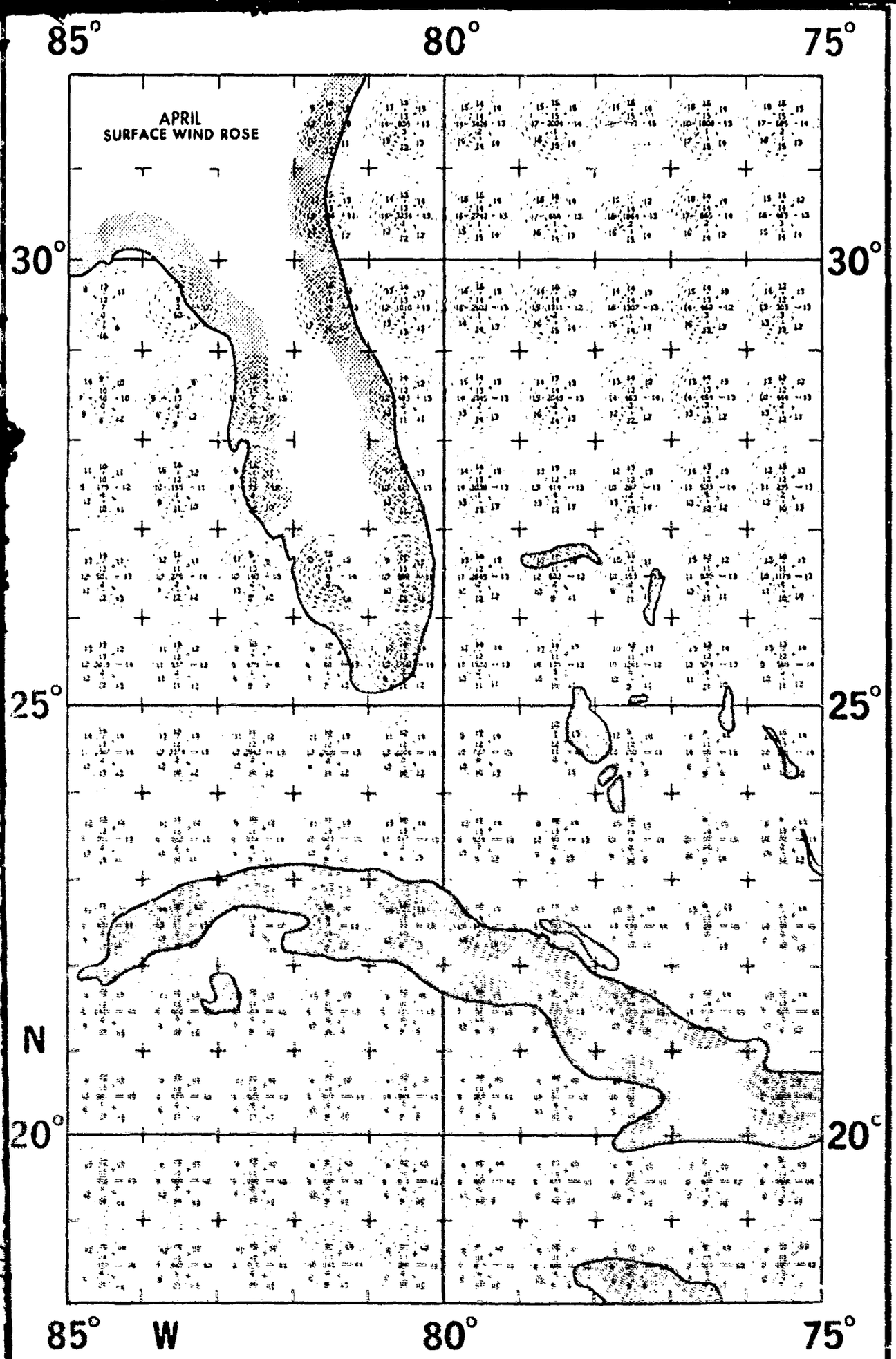

80°
75°
70°
>1
1
3
30°
3
1
2
2
25°
25°
N
20°
20°
85° W
80°
75°
70°
65°
APRIL
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE -
CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES

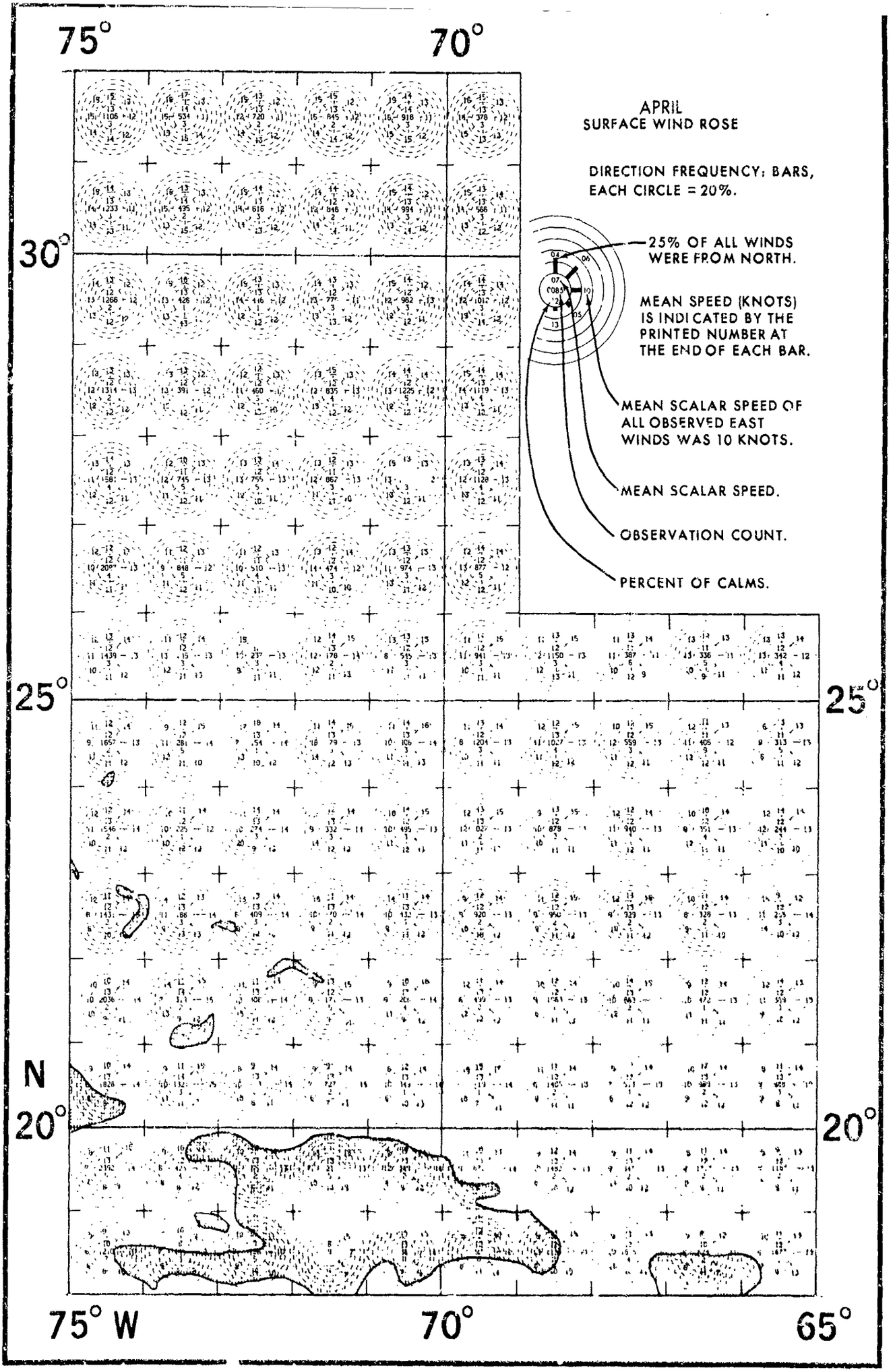

APRIL
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°

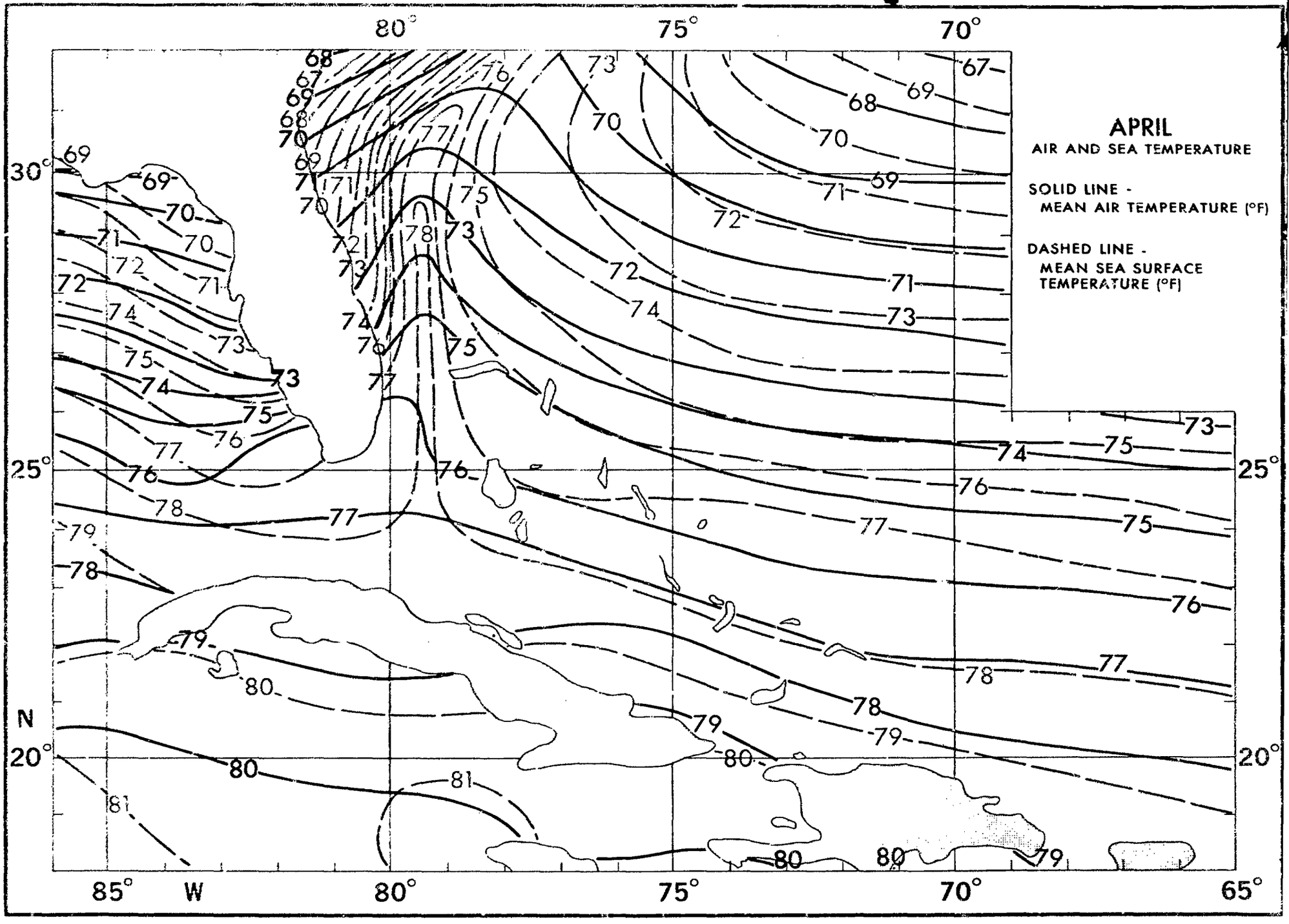

80°
75°
70°
30°
25°
20°
N
85°
W
65°
APRIL
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)
11
12
13
14
15
10
12
13
12
12
13
13
11
12
13
11
12
12
12

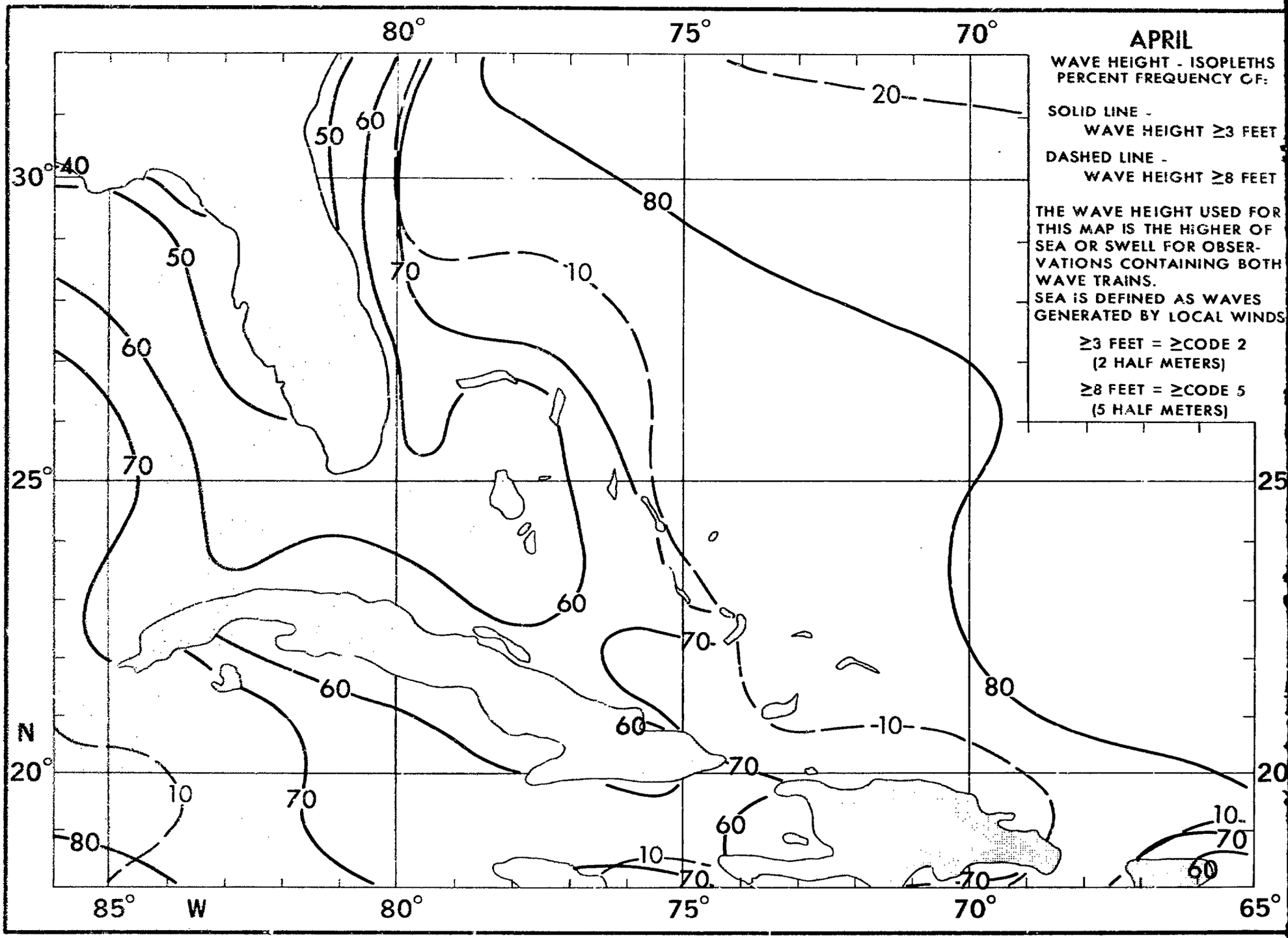

APRIL
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
>1
1
30
40
50
60
70

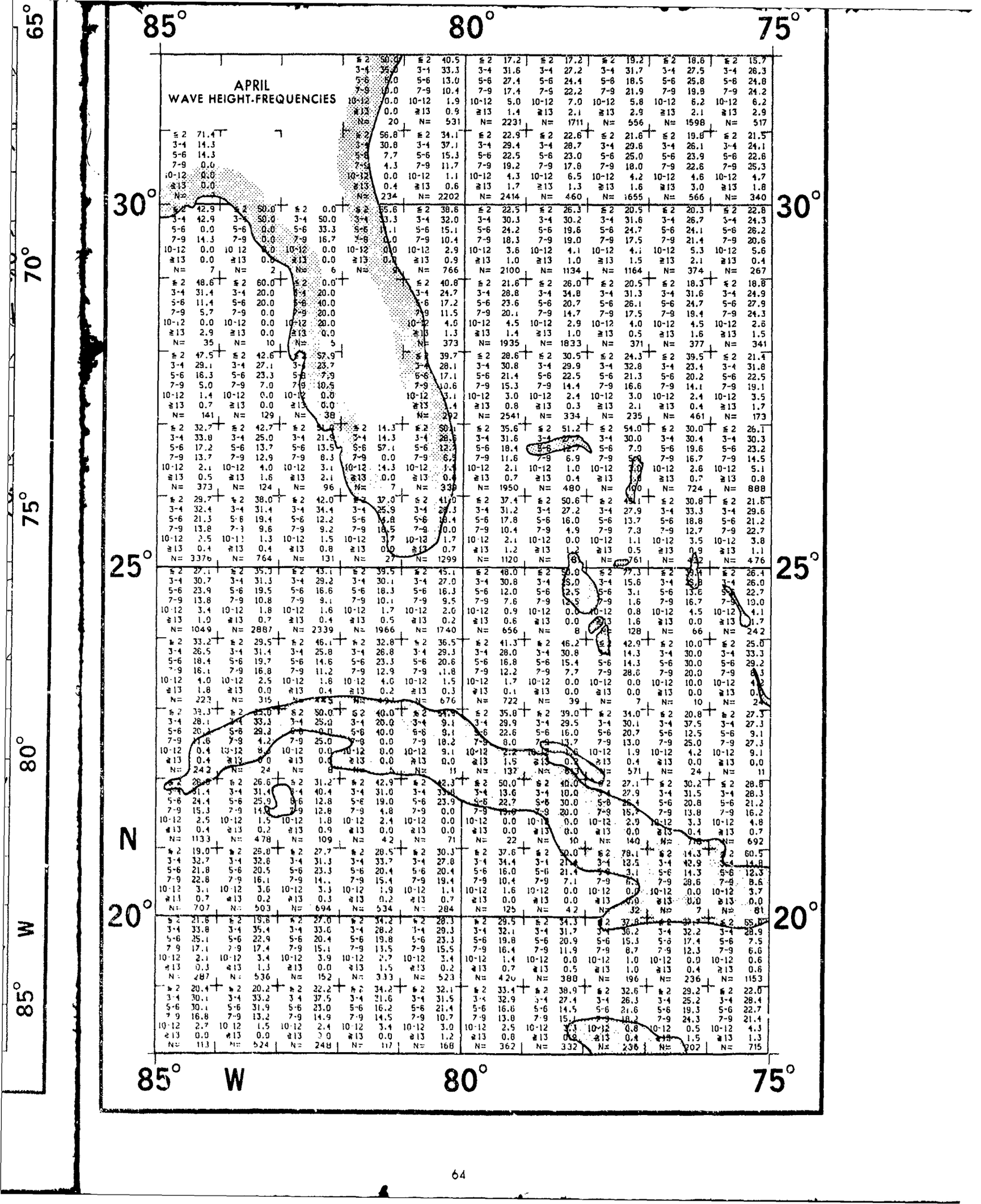

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
APRIL
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED 11-21 KNOTS
DASHED LINE -
WIND SPEED 22-33 KNOTS
40
50
15
10
50
40
50
40
5
50
40
50
5
50
40
40
30
40
50

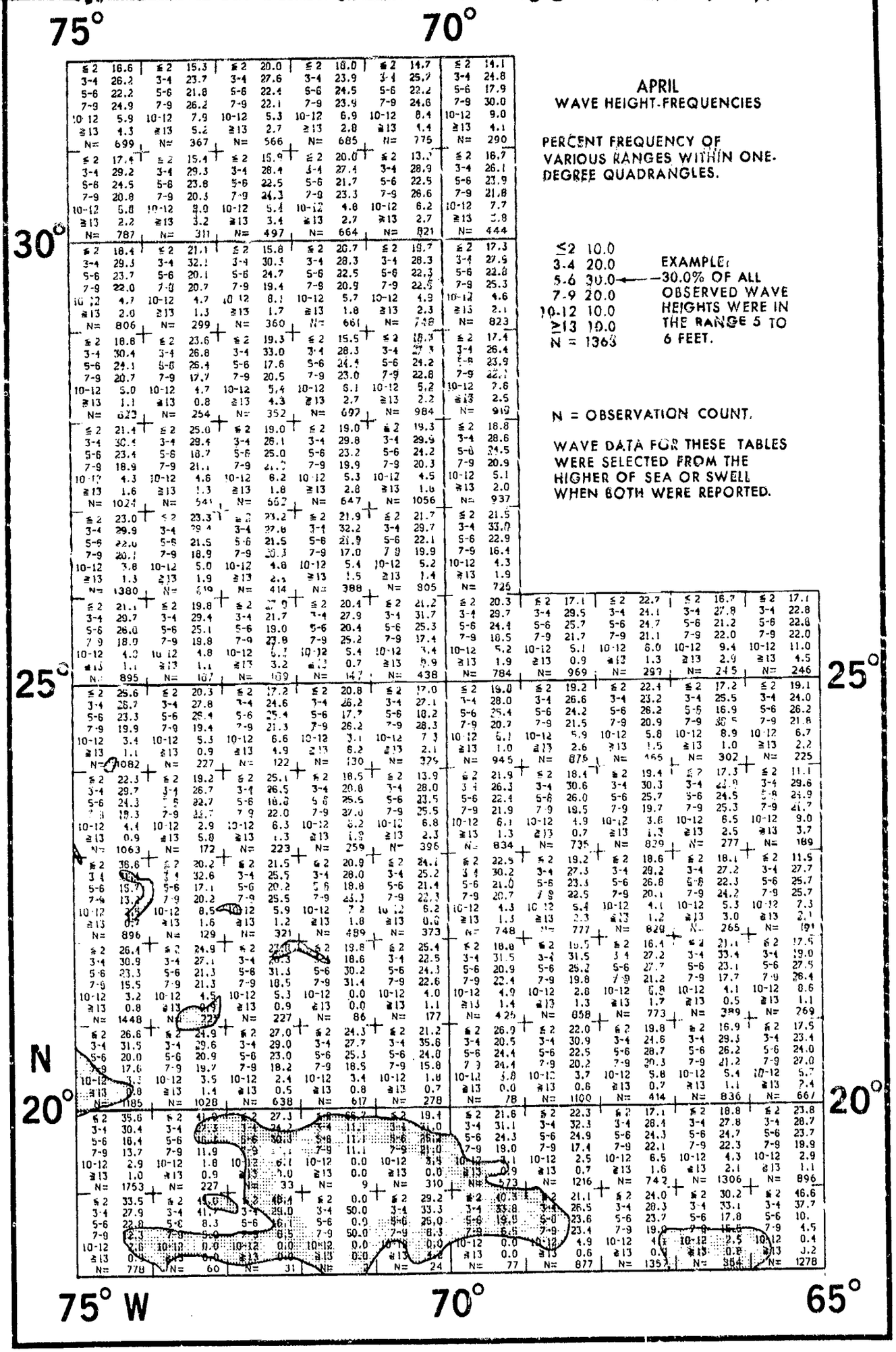

APRIL
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
85° W
80°
75°


75°
70°
30°
25°
20°
N
75° W
70°
65°
APRIL
SURFACE WIND ROSE
DIRECTION FREQUENCY; BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


APRIL
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°


APRIL
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEET
DASHED LINE -
WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
10
20
40
50
60
70
80


APRIL
WAVE HEIGHT-FREQUENCIES
85°
80°
75°
65°
70°
75°
80°
85°
30°
25°
20°
N
W
85° W
80°
75°



APRIL
WAVE HEIGHT-FREQUENCIES

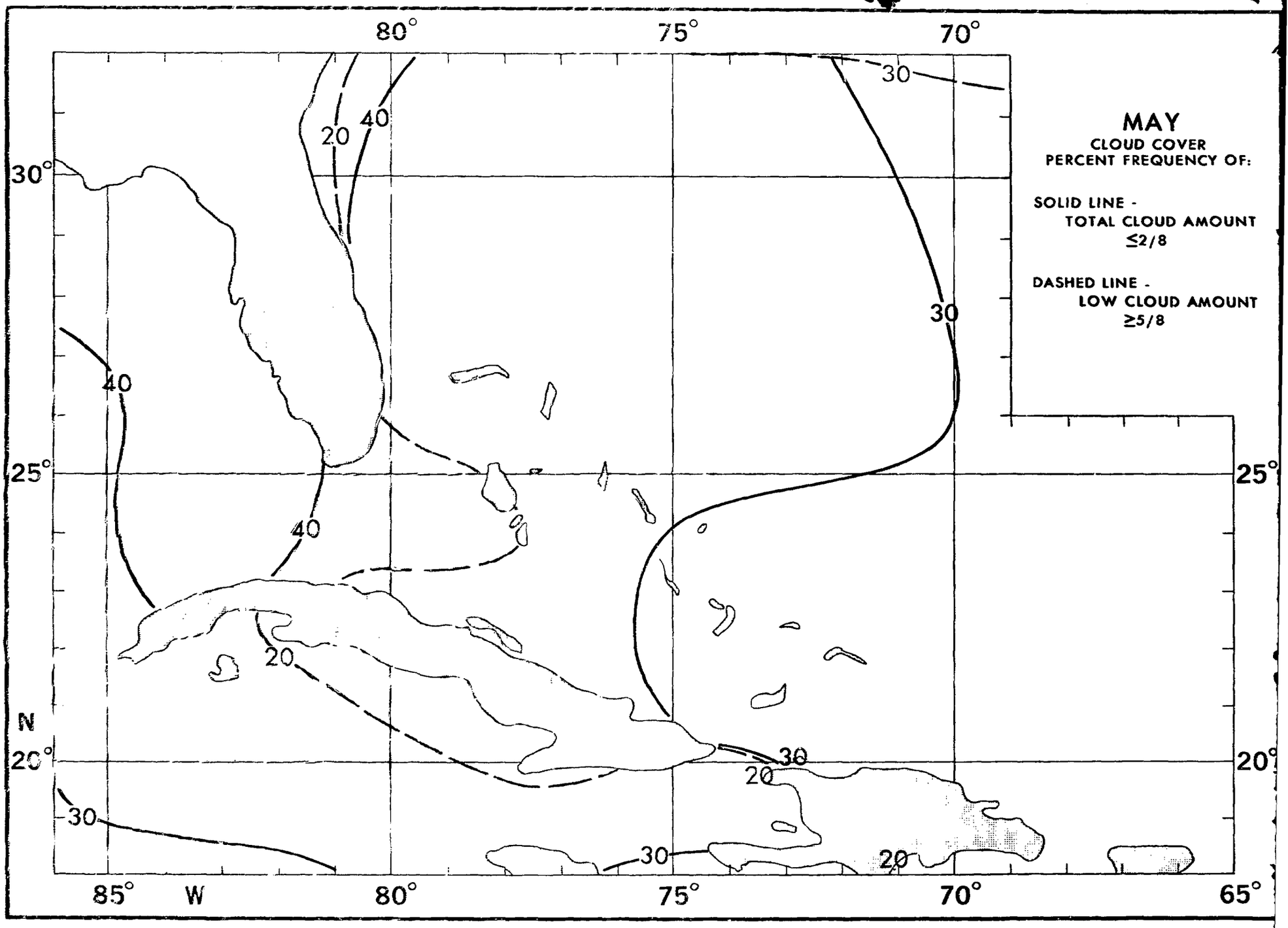
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

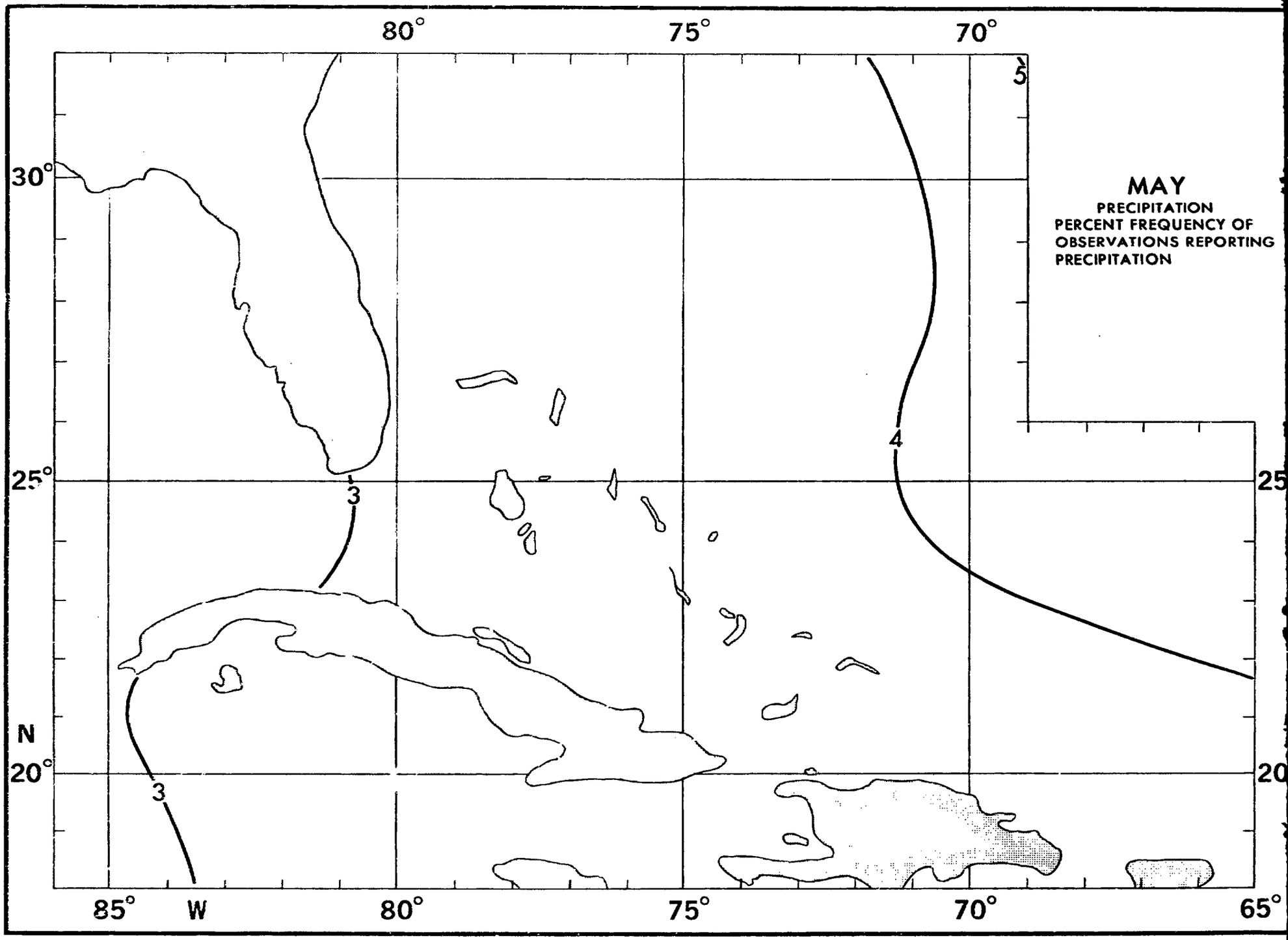
≤2	10.0
3-4	20.0
5-6	30.0
7-9	20.0
10-12	10.0
≥13	10.0
N =	1363

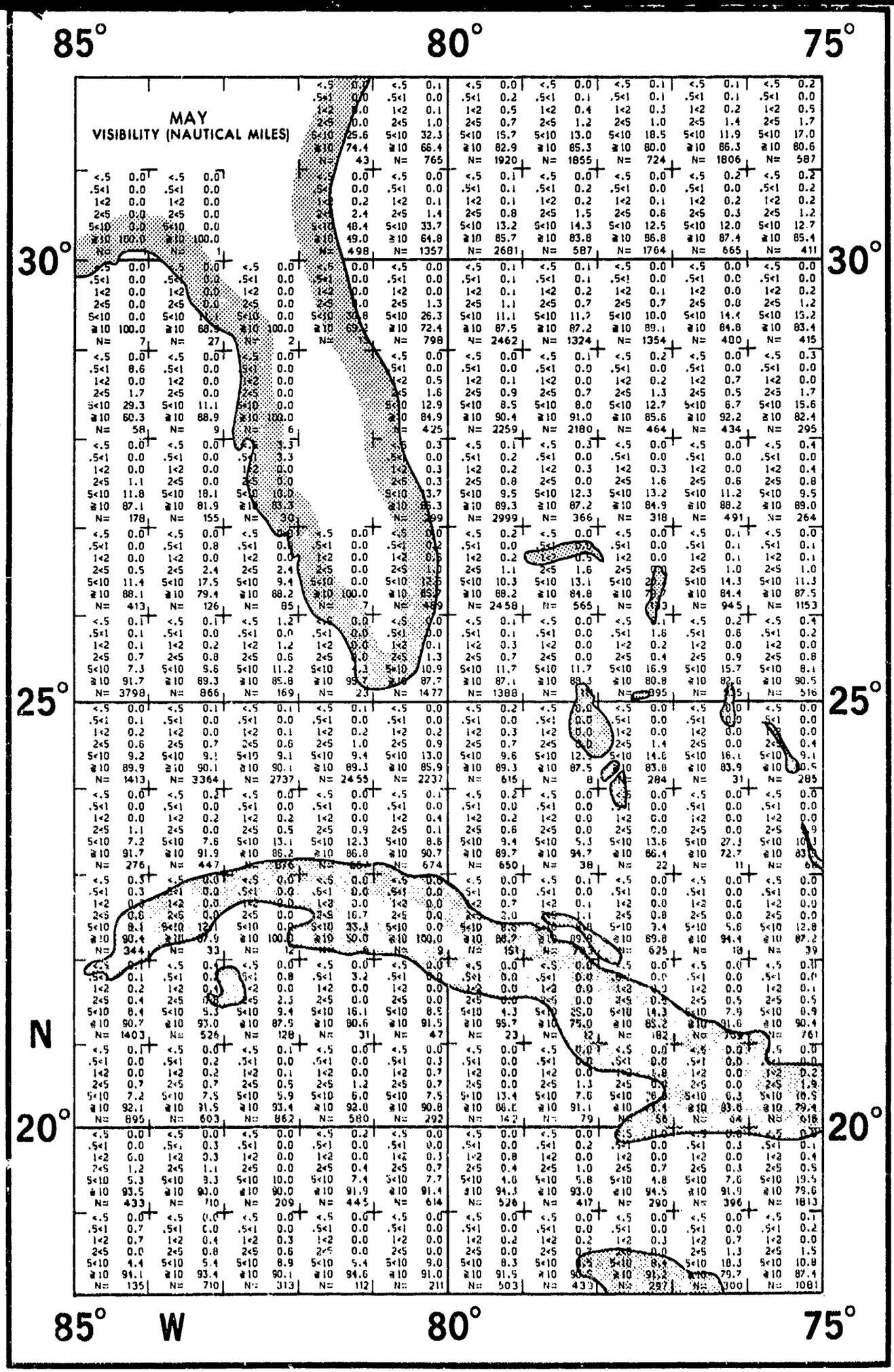
EXAMPLE: 30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.

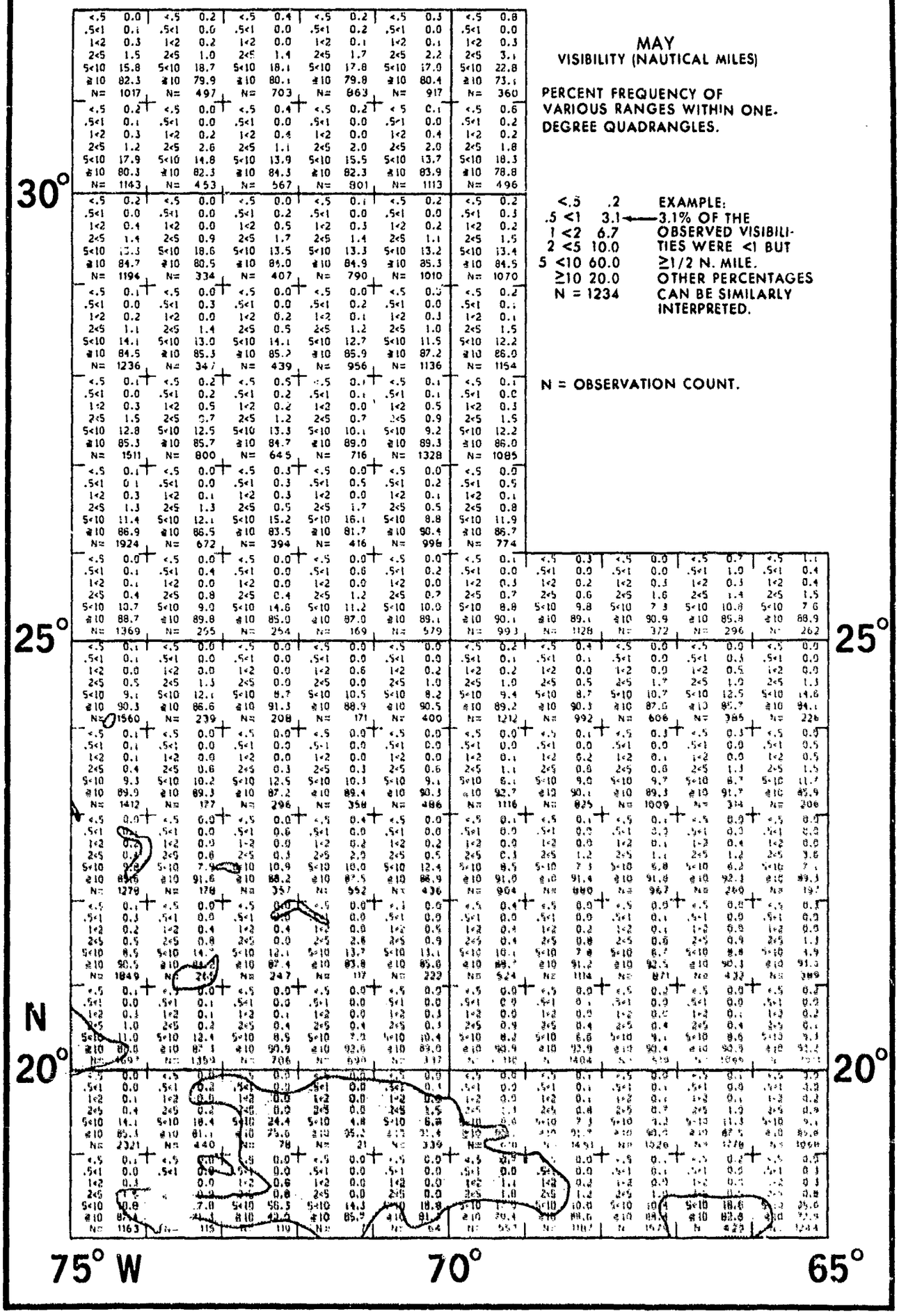
N = OBSERVATION COUNT.

WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


MAY
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/8
80°
75°
70°
30°
25°
20°
N
85°
W
65°
20
40
30
40
40
30
20
30
20
30
20
30


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
5
4
3
3
MAY
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION


MAY
VISIBILITY (NAUTICAL MILES)
85°
80°
75°
30°
25°
20°
N
85° W
80°
75°



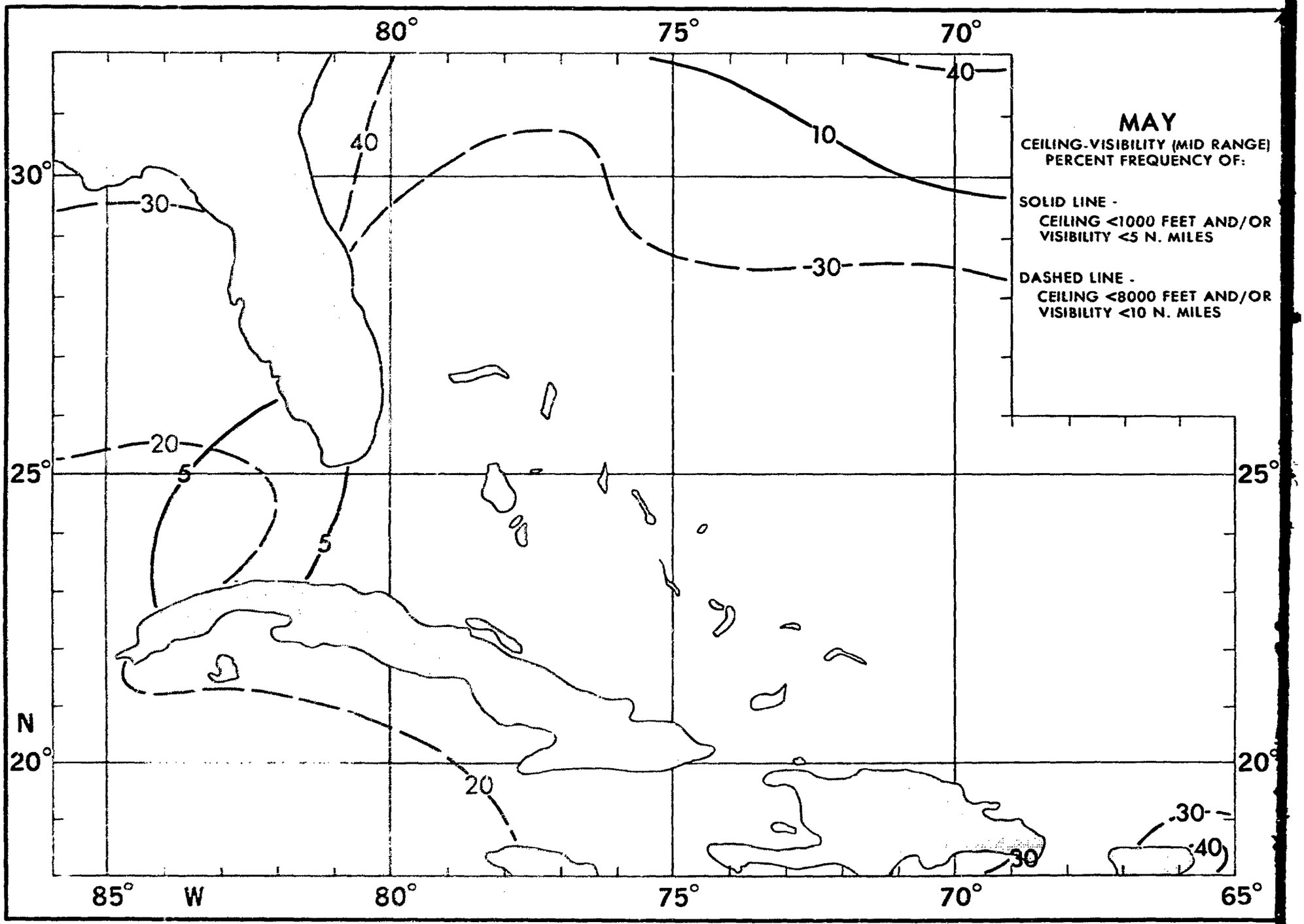
MAY
VISIBILITY (NAUTICAL MILES)

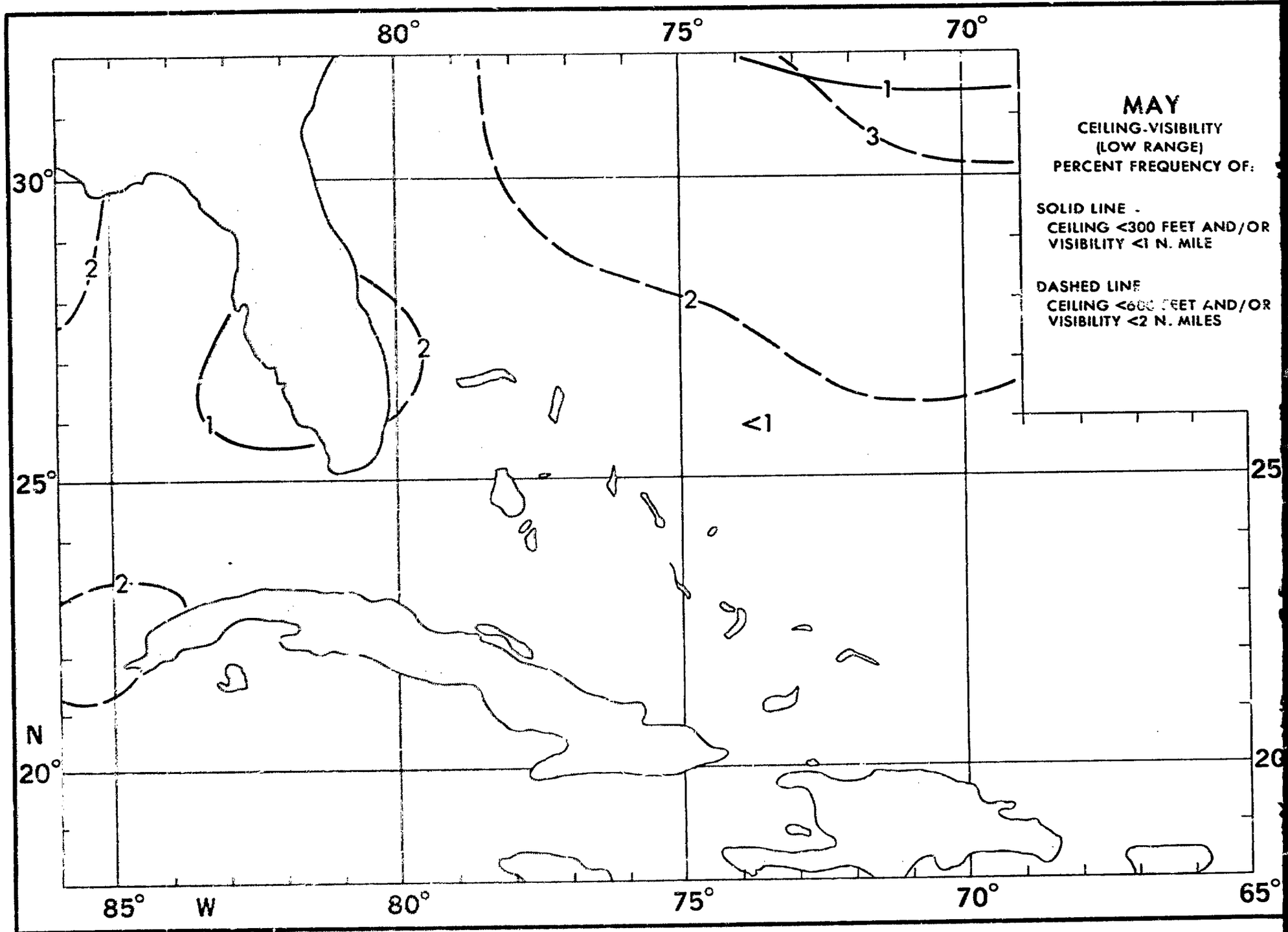
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE. DEGREE QUADRANGLES.

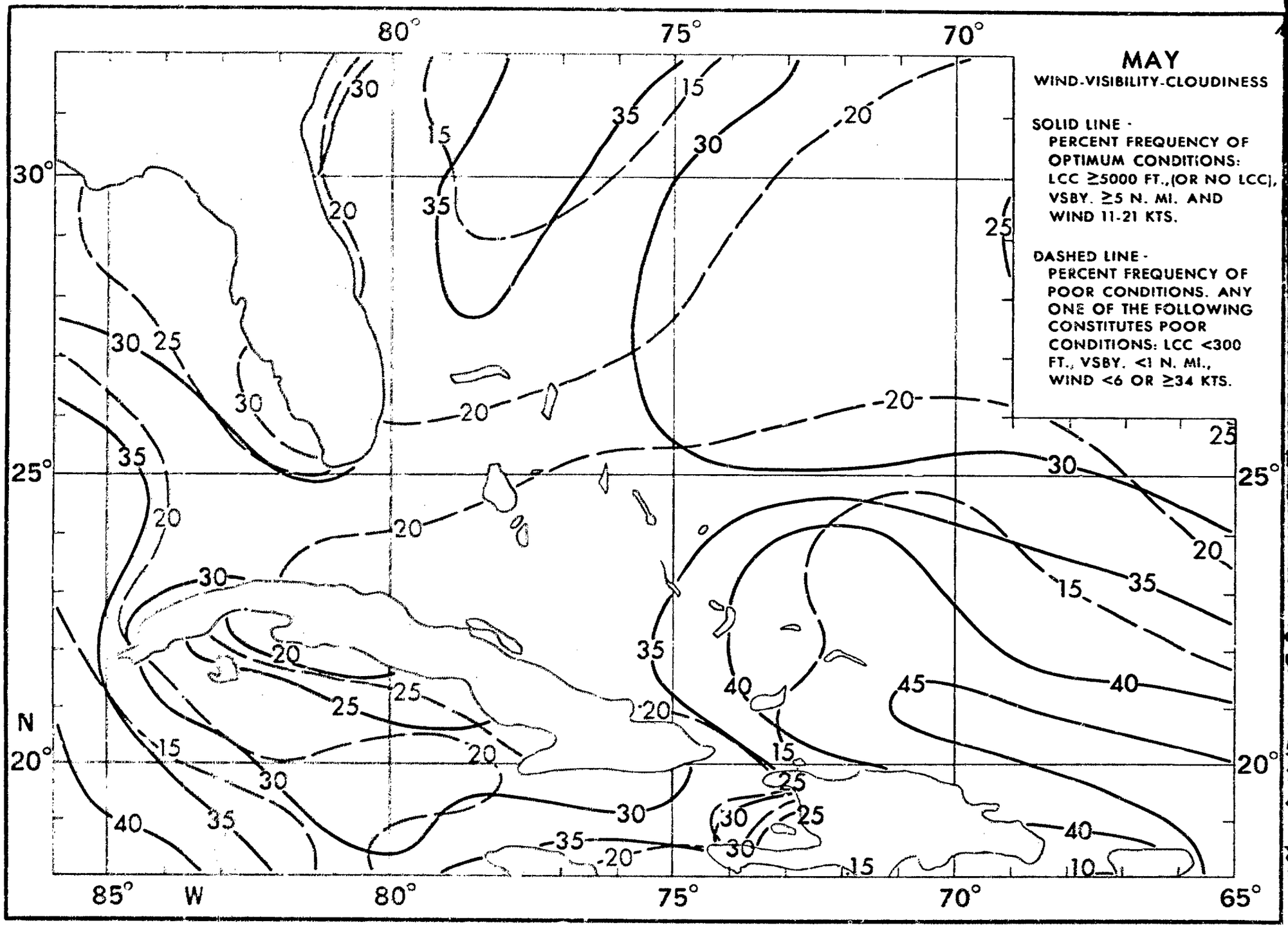
<.5	.2
.5 <1	3.1
1 <2	6.7
2 <5	10.0
5 <10	60.0
≥10	20.0
N =	1234

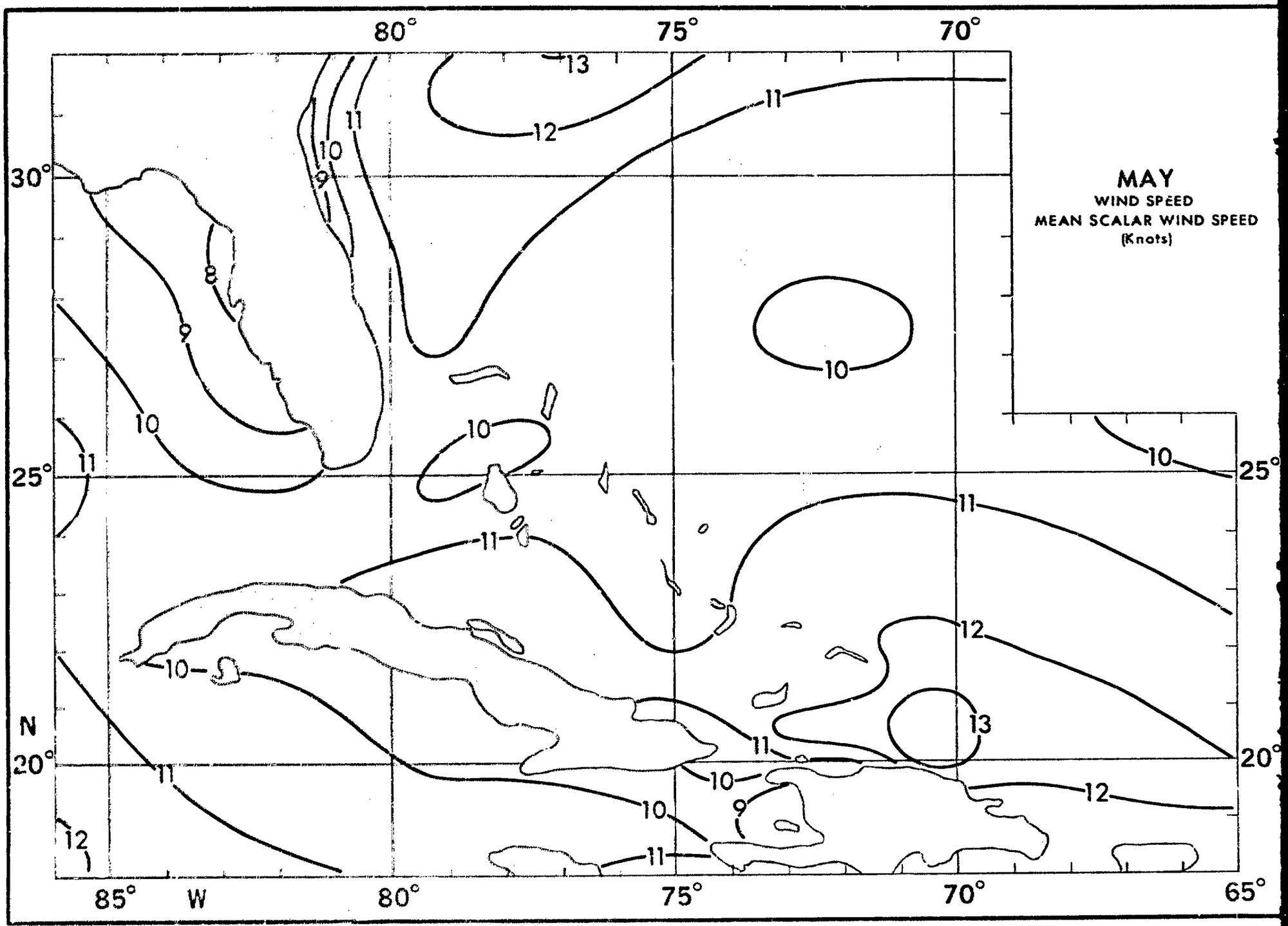
EXAMPLE: 3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE. OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.

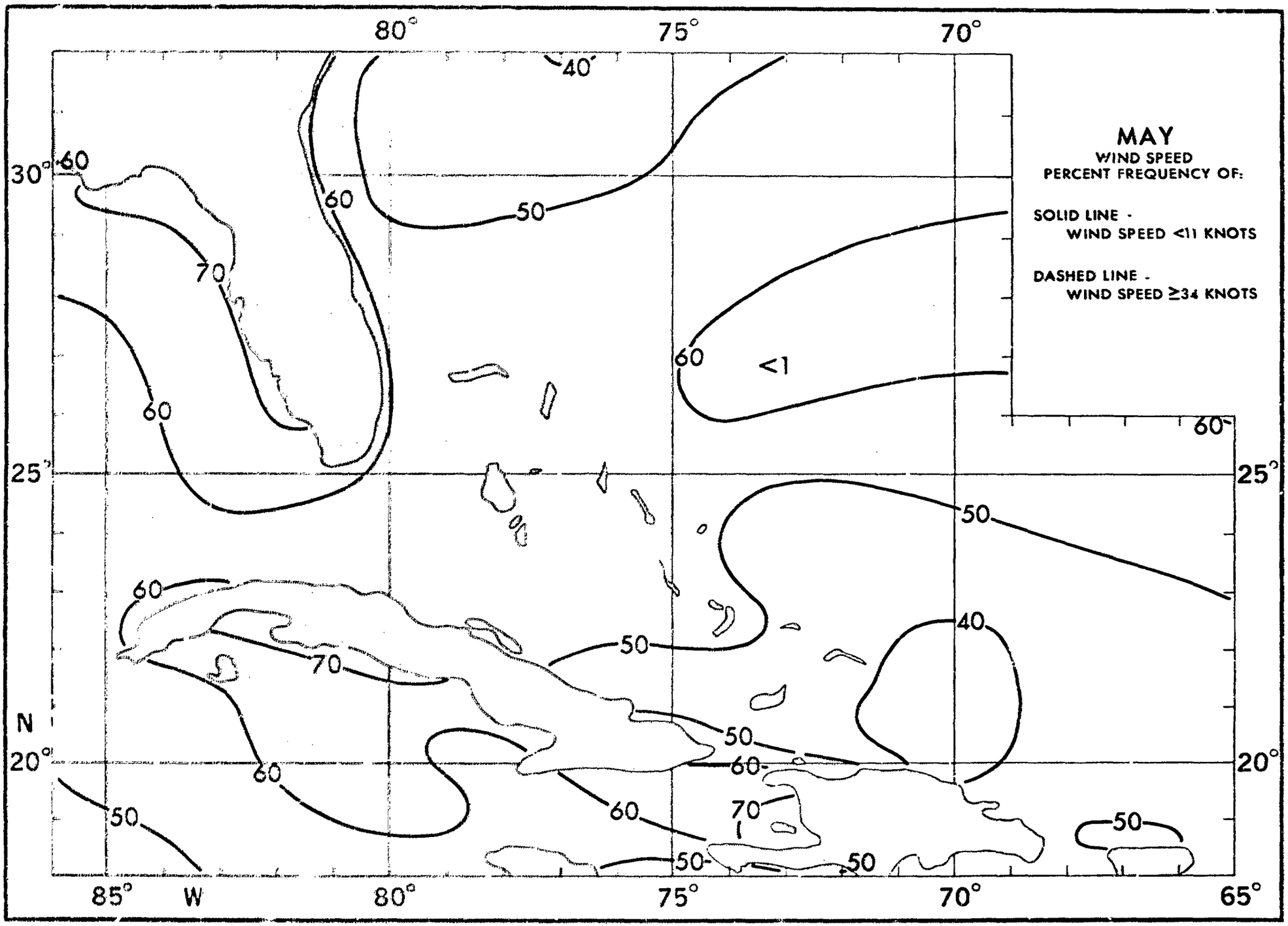
N = OBSERVATION COUNT.

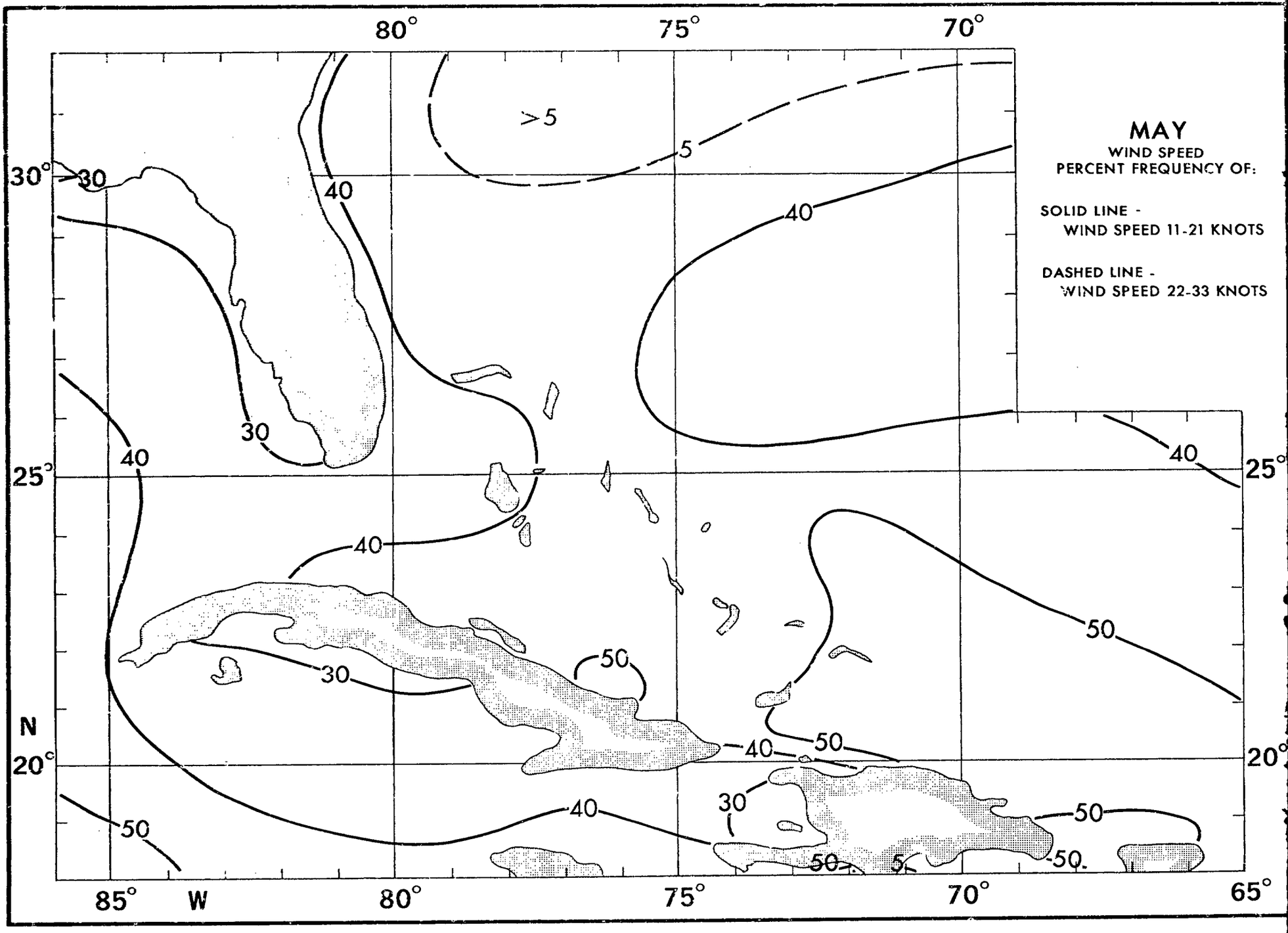

80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°
MAY
CEILING-VISIBILITY (MID RANGE) PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <8000 FEET AND/OR VISIBILITY <10 N. MILES
40
10
30
40
30
20
5
5
20
30
30
40

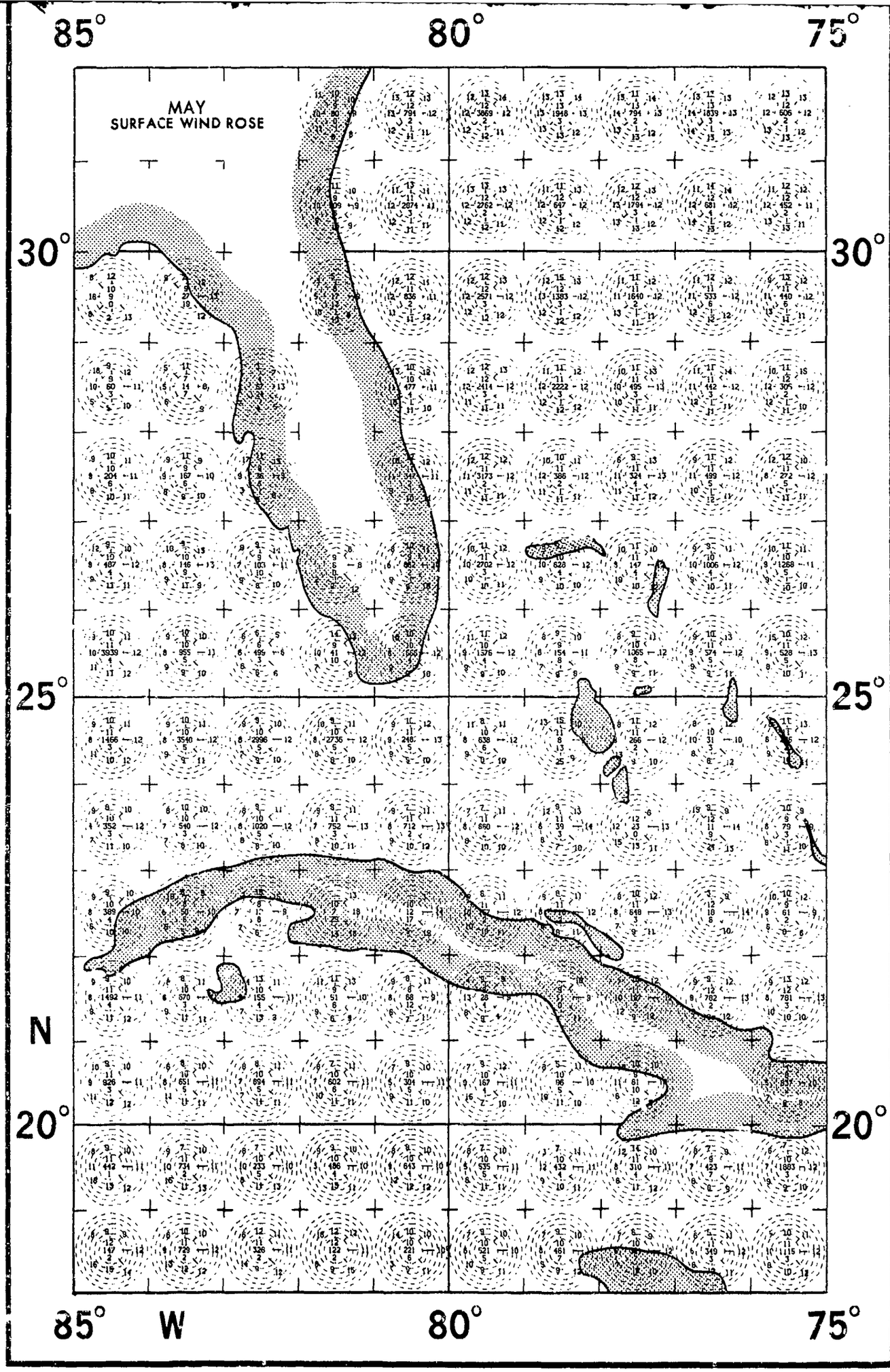

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
MAY
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE
CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES
1
2
3
<1

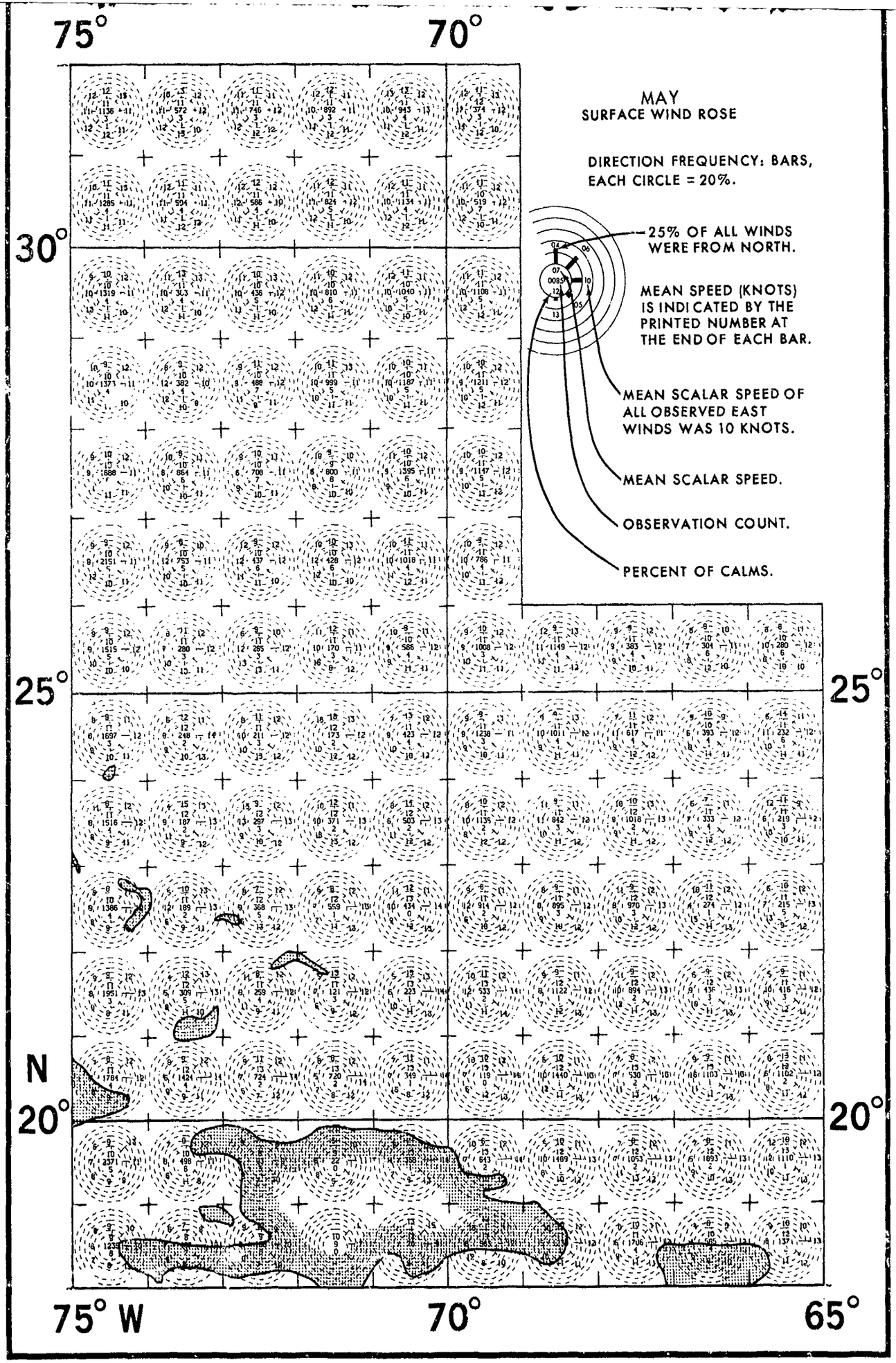

MAY
WIND-VISIBILITY-CLOUDINESS
SOLID LINE -
PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE -
PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°

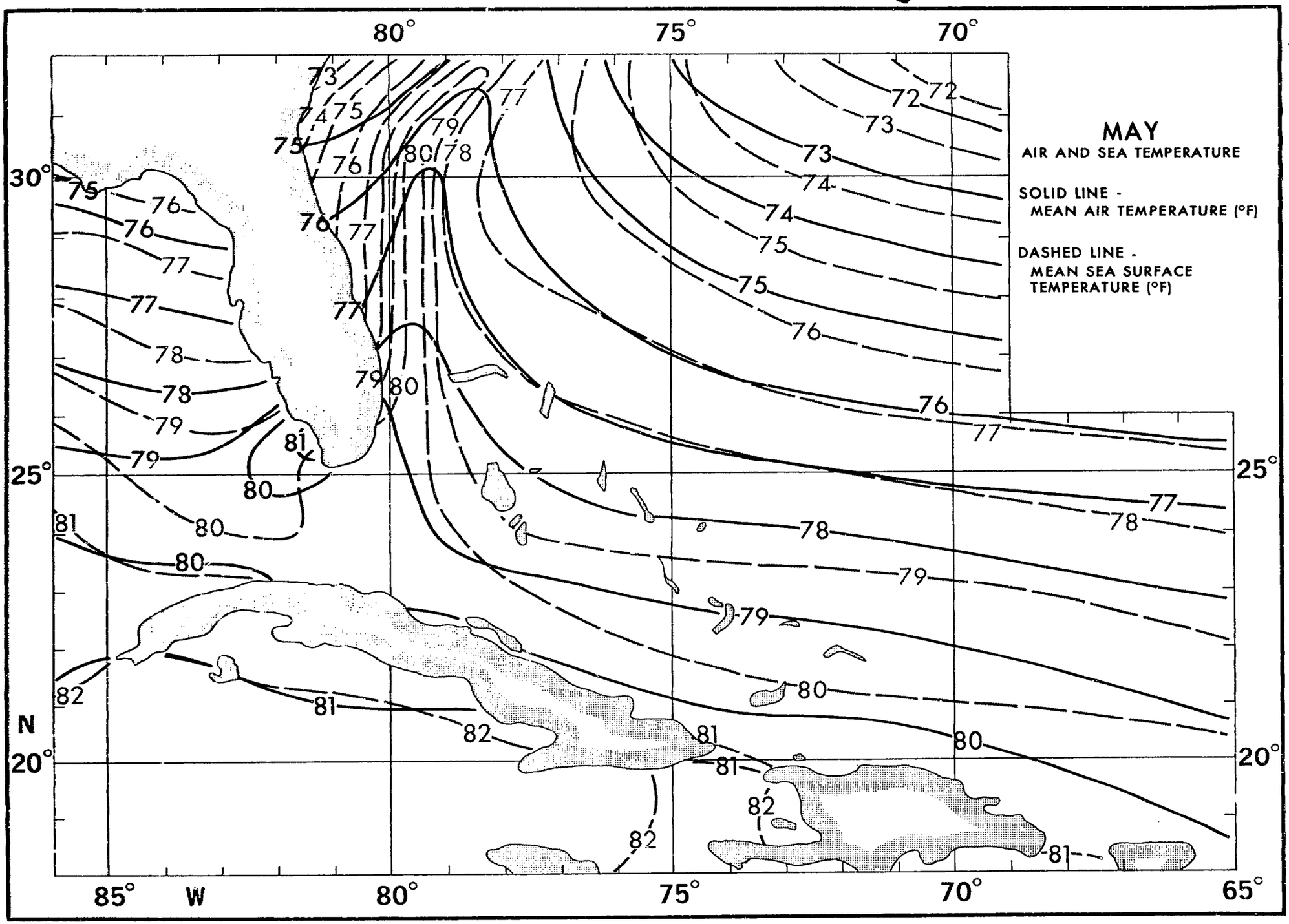

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
MAY
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)

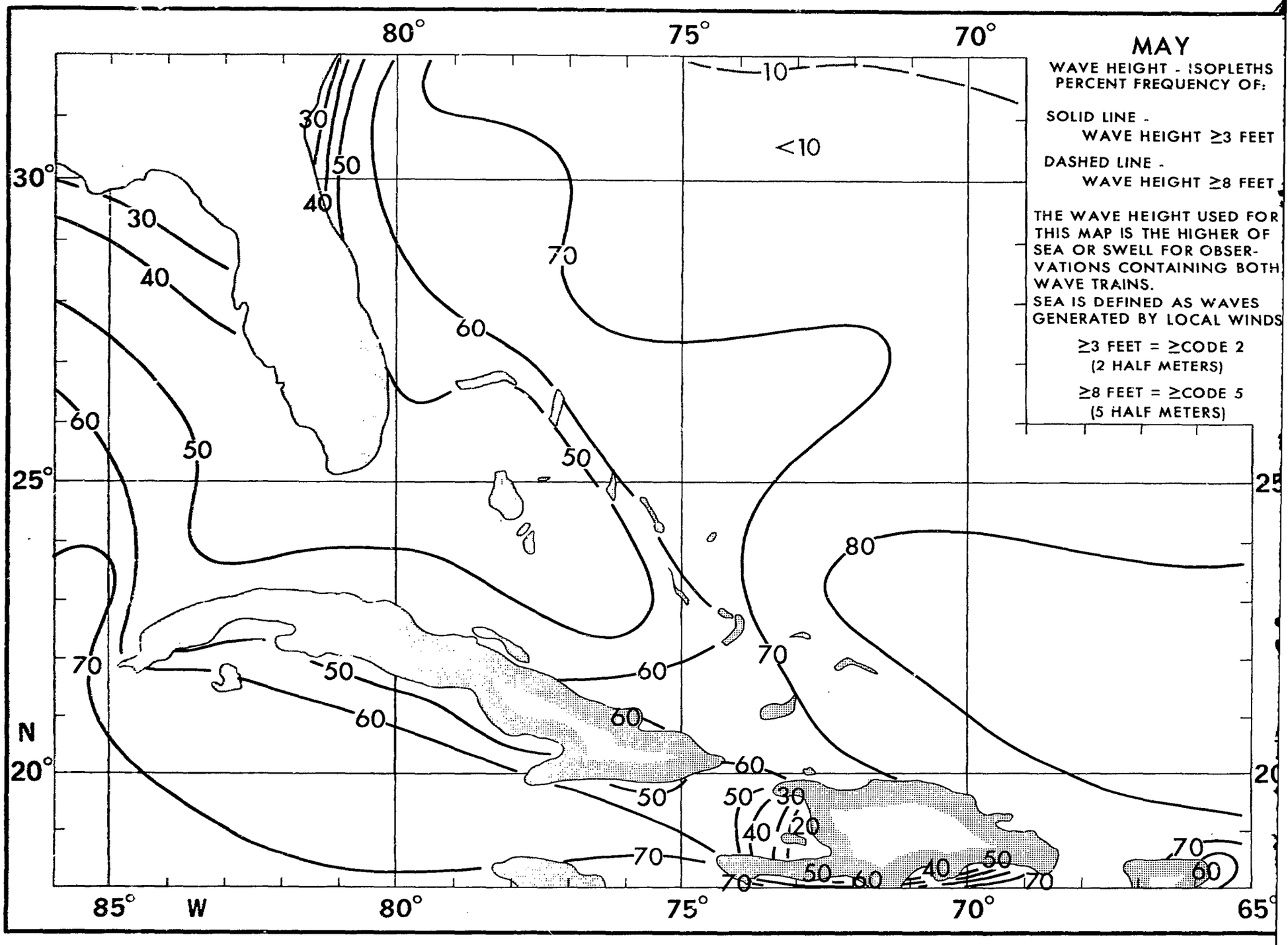

85° W
80°
75°
70°
65°
30°
25°
20° N
40
50
60
70
<1
MAY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS

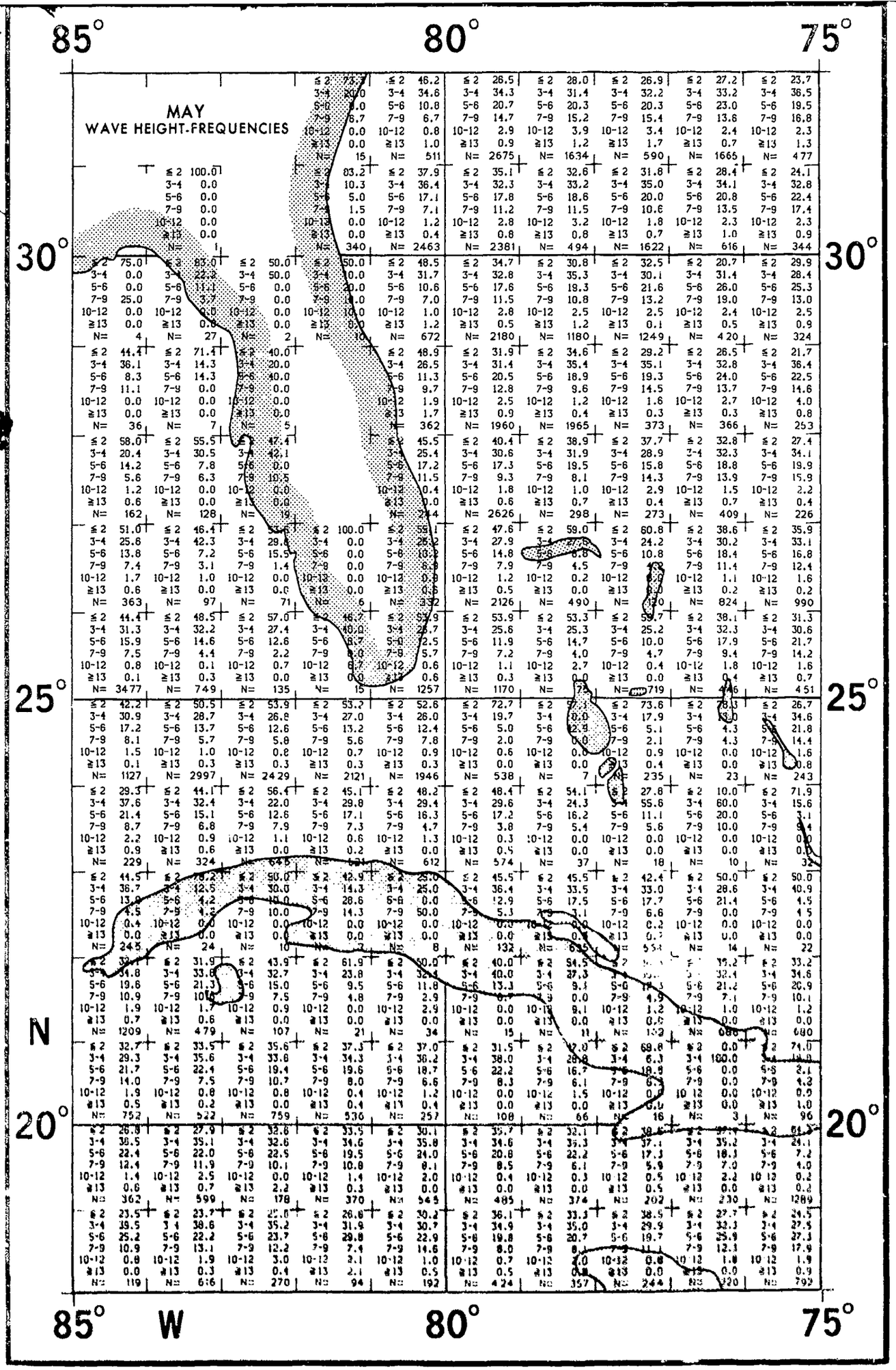

MAY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED 11-21 KNOTS
DASHED LINE -
WIND SPEED 22-33 KNOTS
80°
75°
70°
30°
25°
20°
N
85°
W
65°
>5
5
30
40
50

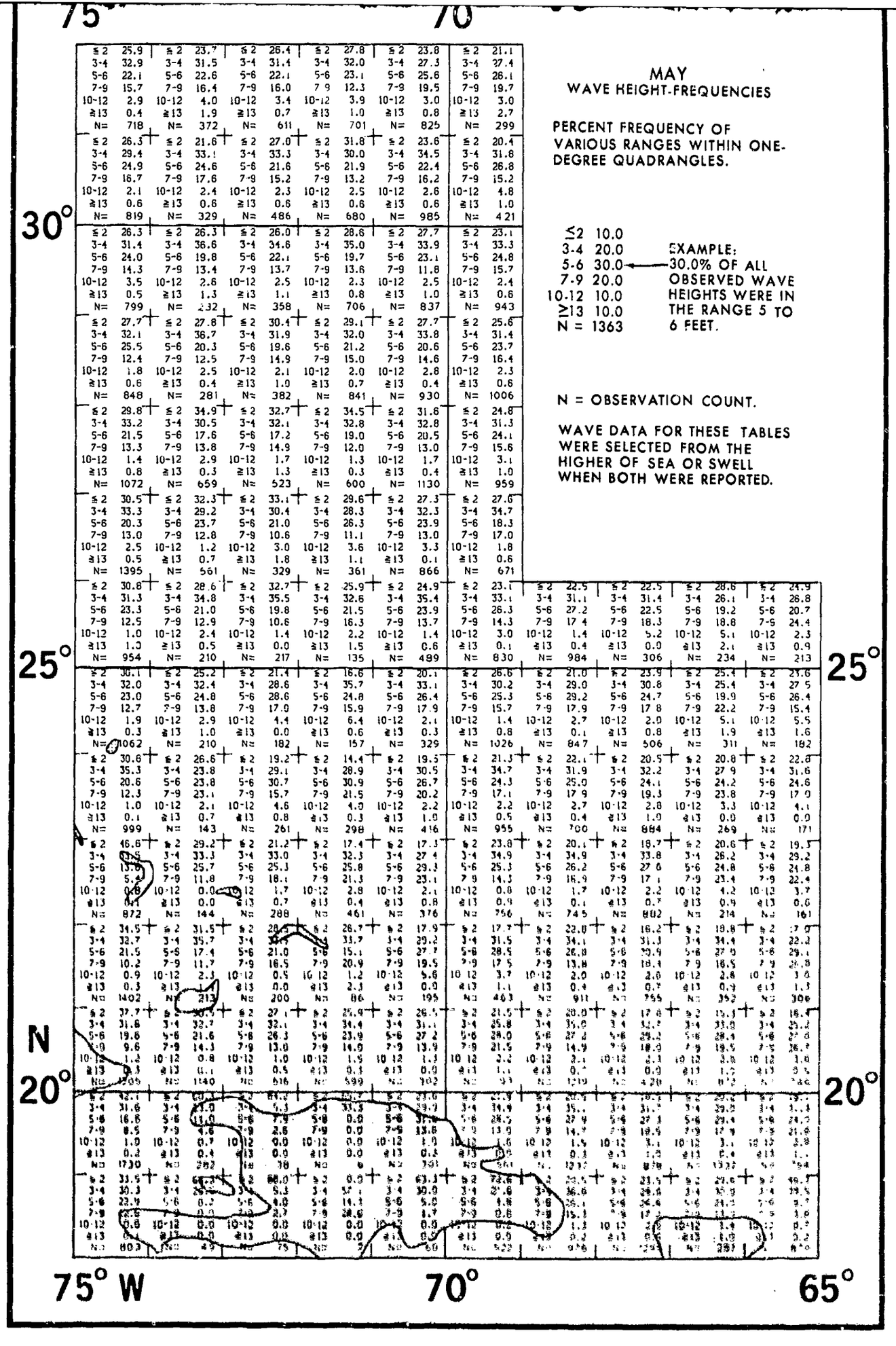

MAY
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
W


75°
70°
30°
25°
20°
N
75° W
70°
65°
MAY
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


MAY
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°


MAY
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEET
DASHED LINE -
WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
80°
75°
70°
30°
25°
N
20°
85° W
80°
75°
70°
65°
<10
10
20
30
40
50
60
70
80
90


MAY
WAVE HEIGHT-FREQUENCIES
85°
80°
75°
30°
25°
20°
N
W



MAY
WAVE HEIGHT-FREQUENCIES

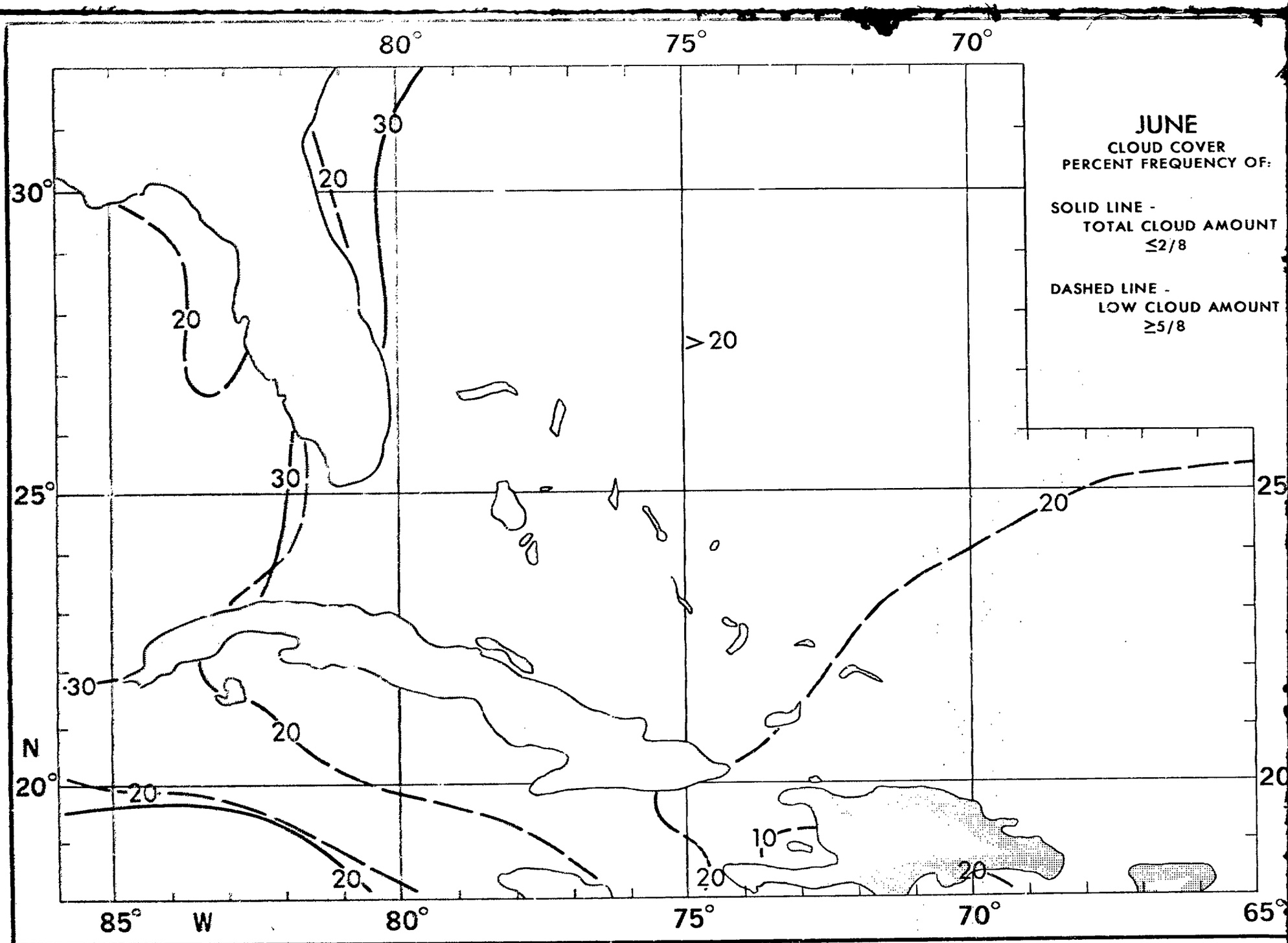
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

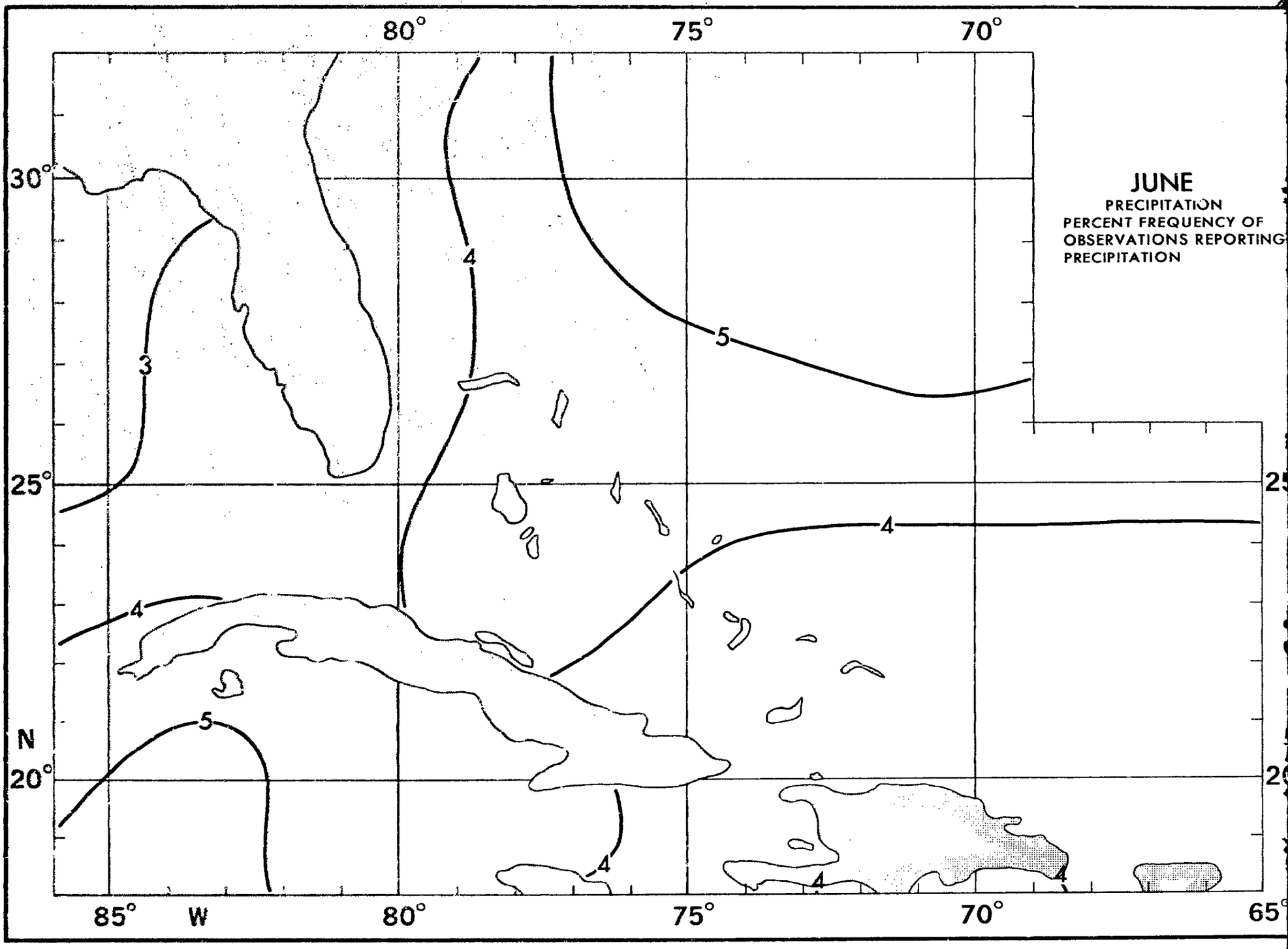
≤2	10.0
3-4	20.0
5-6	30.0
7-9	20.0
10-12	10.0
≥13	10.0
N =	1363

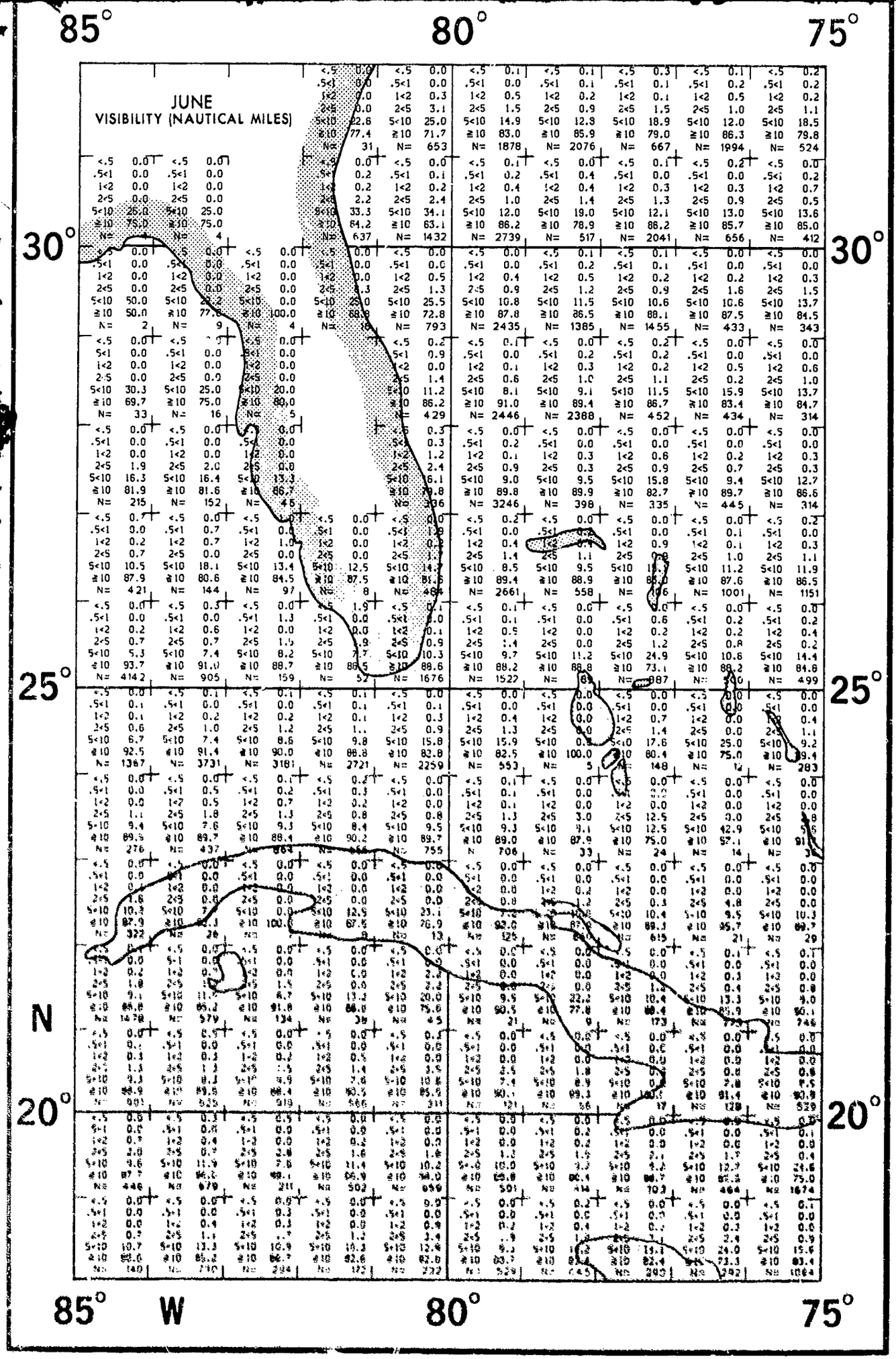
EXAMPLE: 30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.

N = OBSERVATION COUNT.

WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


JUNE
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/8
80°
75°
70°
30°
25°
20°
N
85°
W
65°
30
20
>20
10


JUNE
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
3
4
5


JUNE
VISIBILITY (NAUTICAL MILES)
85°
80°
75°
30°
25°
20°
N
W

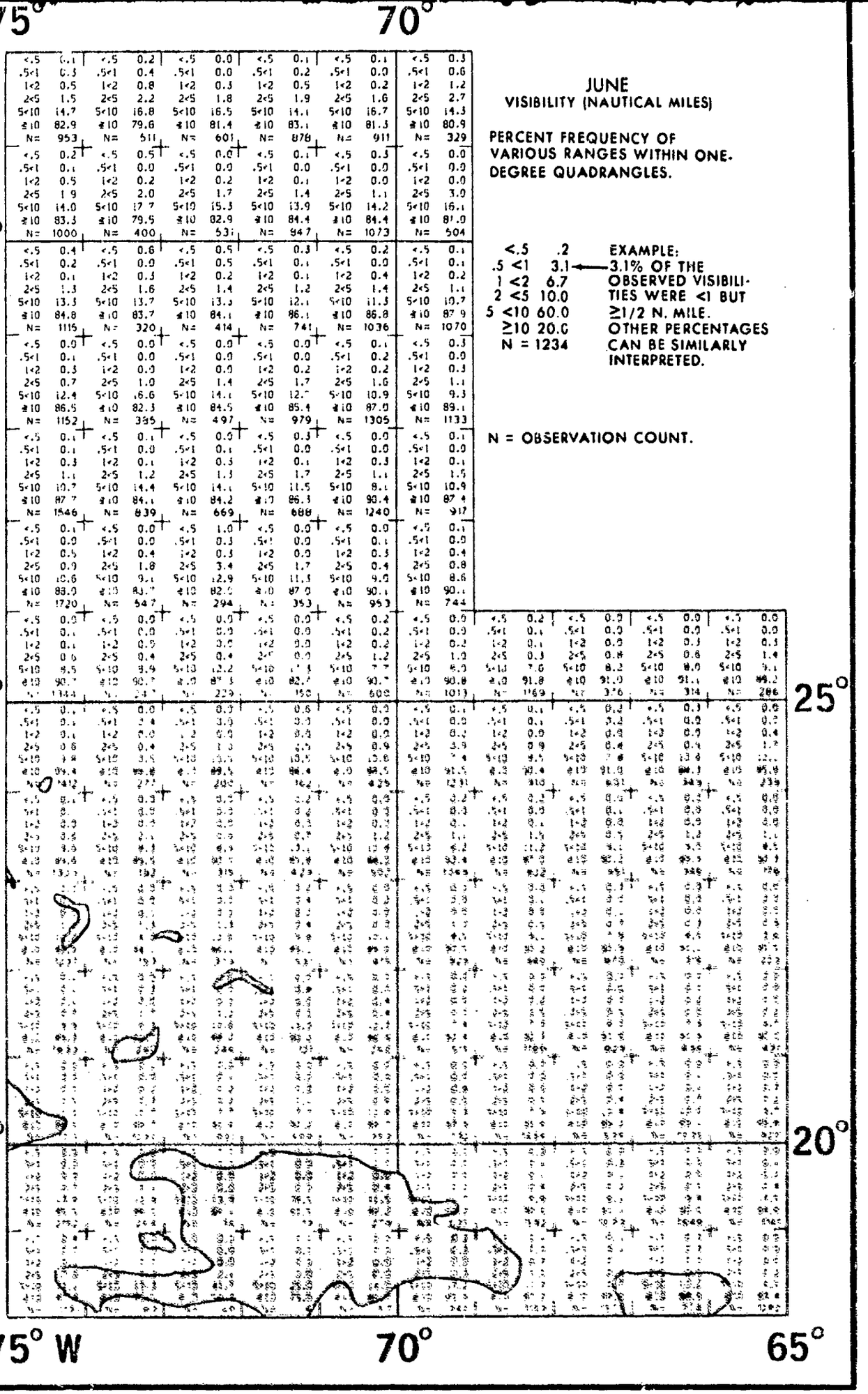
JUNE

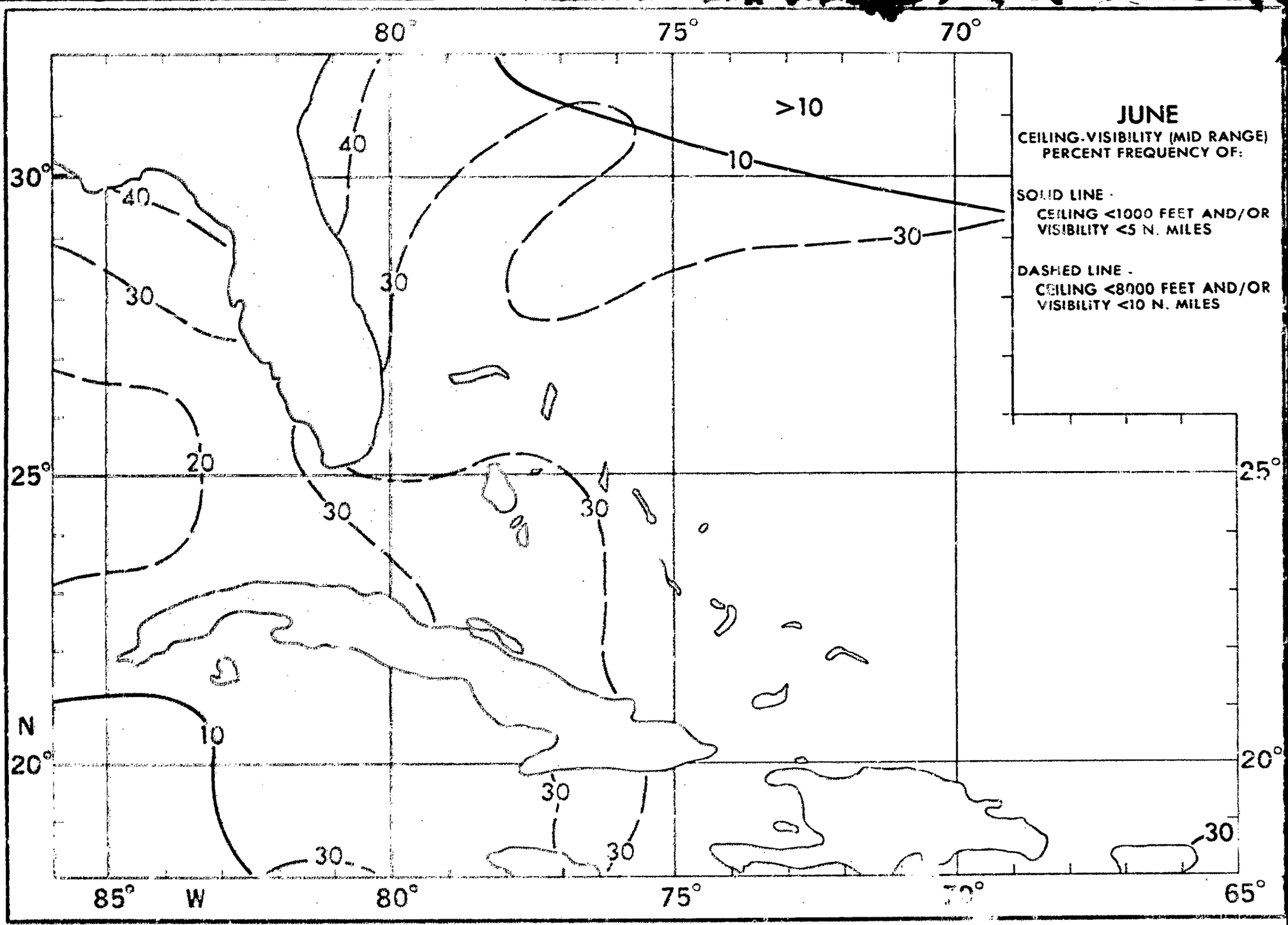
VISIBILITY (NAUTICAL MILES)

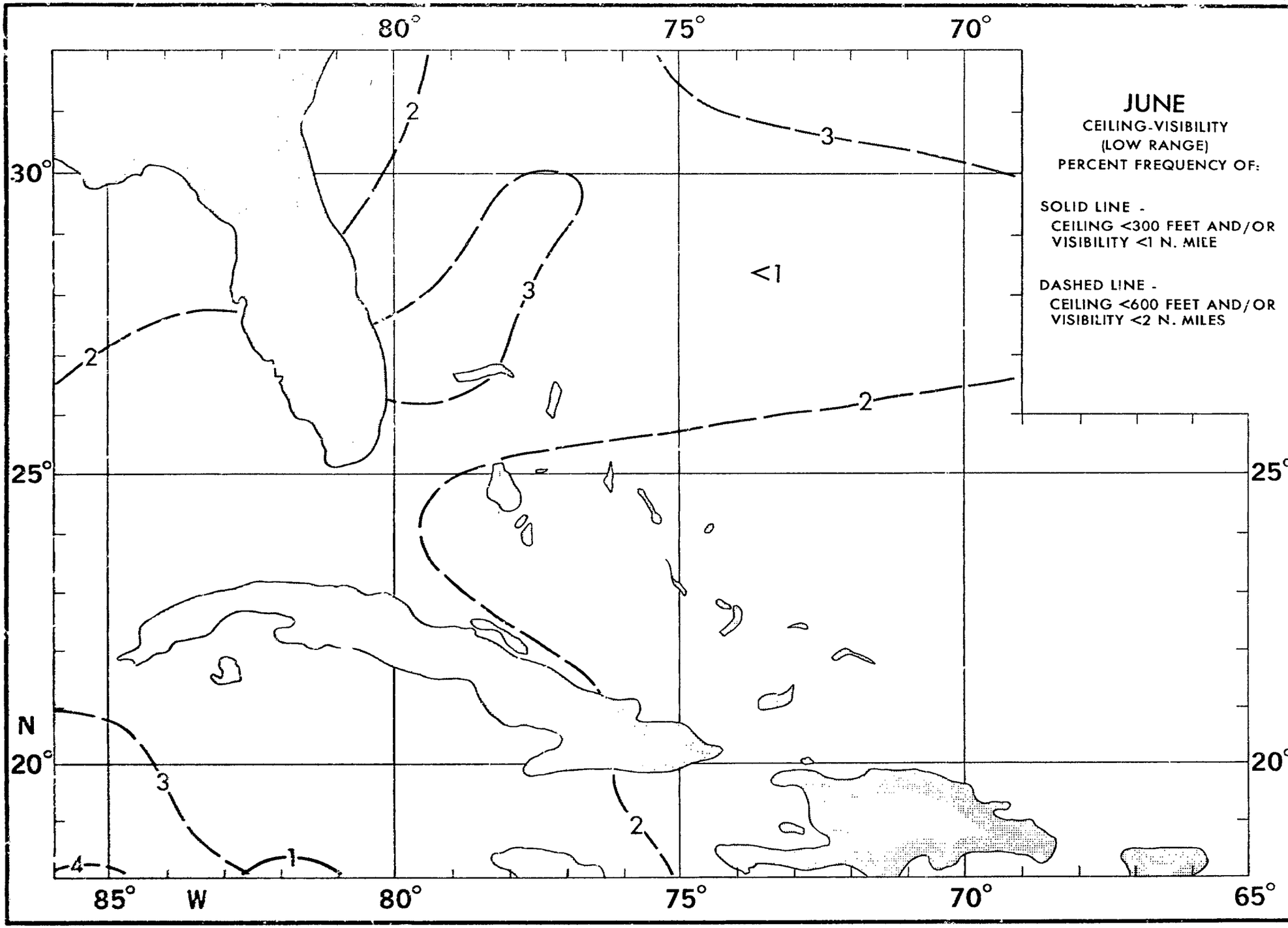
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

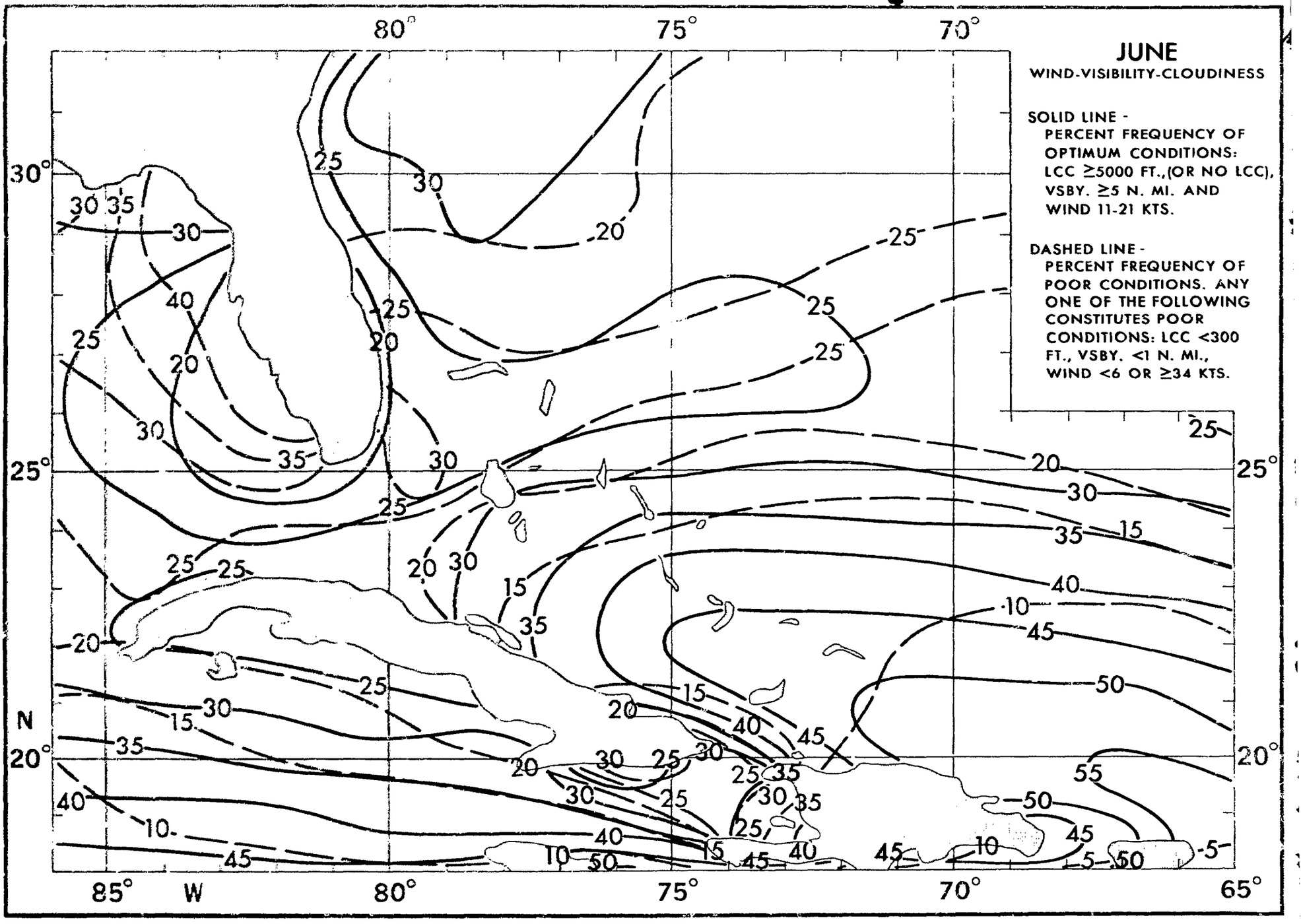
<.5	.2	EXAMPLE:
.5 <1	3.1	← 3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE. OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.
1 <2	6.7	
2 <5	10.0	
5 <10	60.0	
≥10	20.0	
N =	1234	

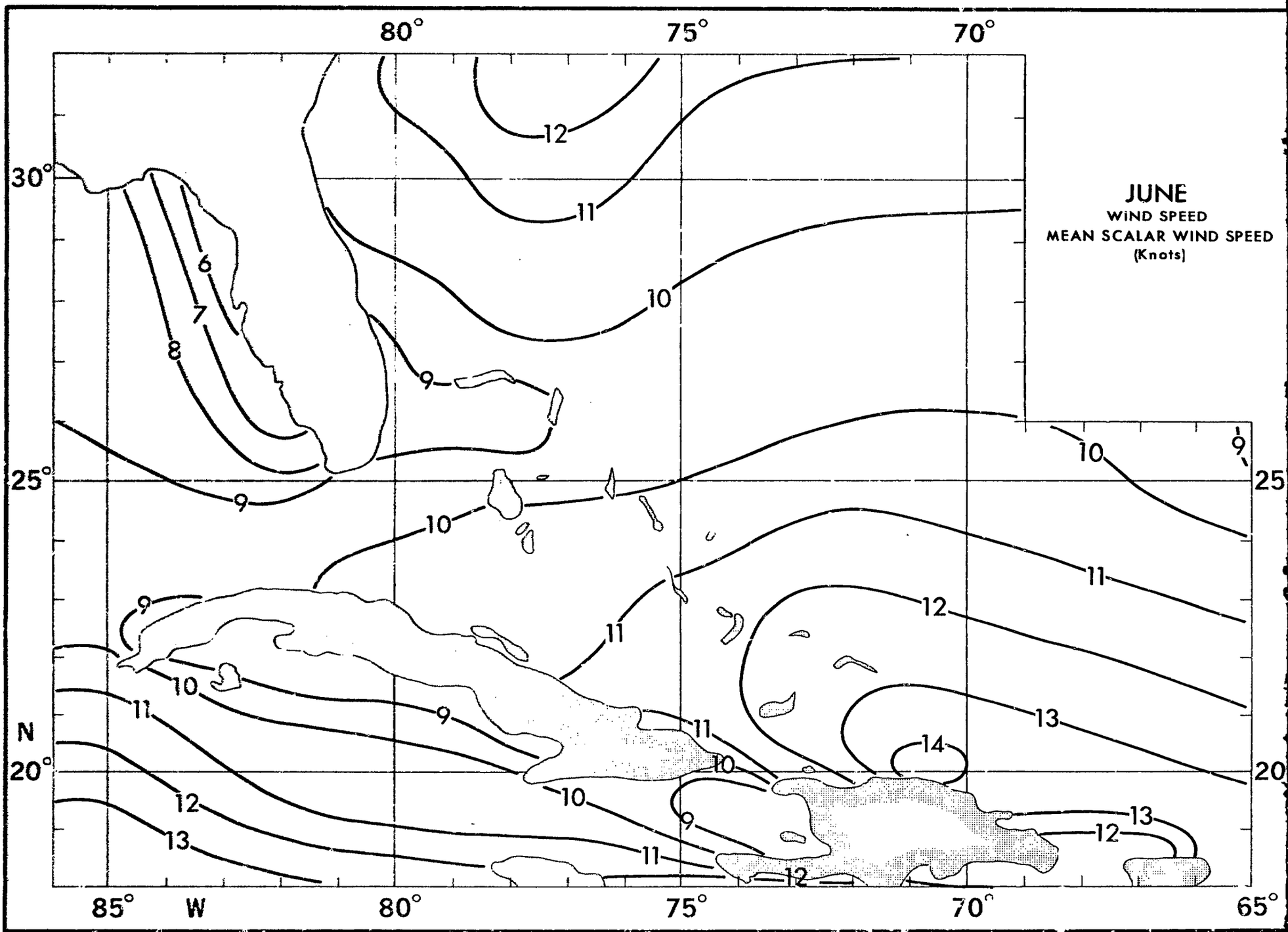
N = OBSERVATION COUNT.

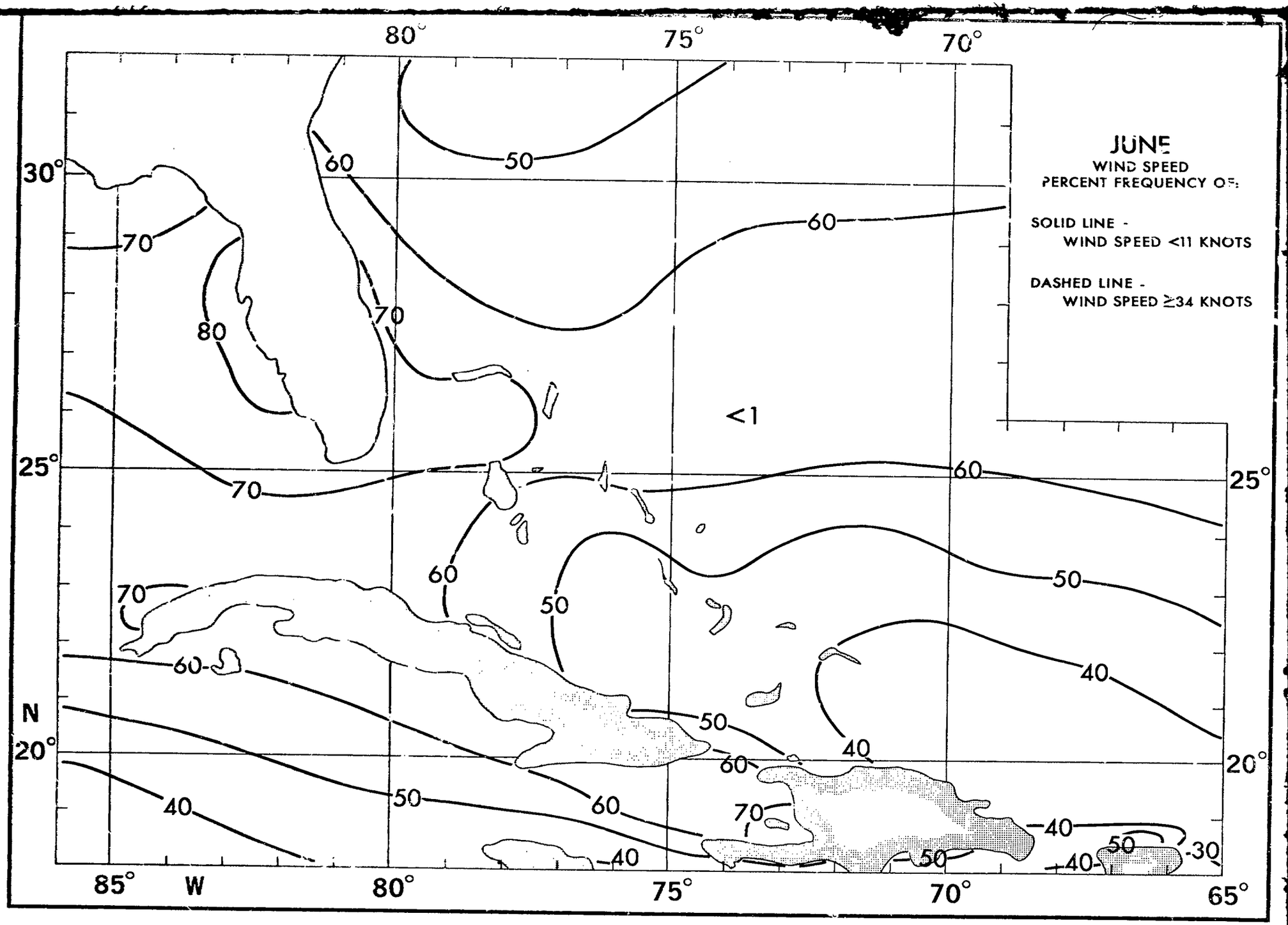


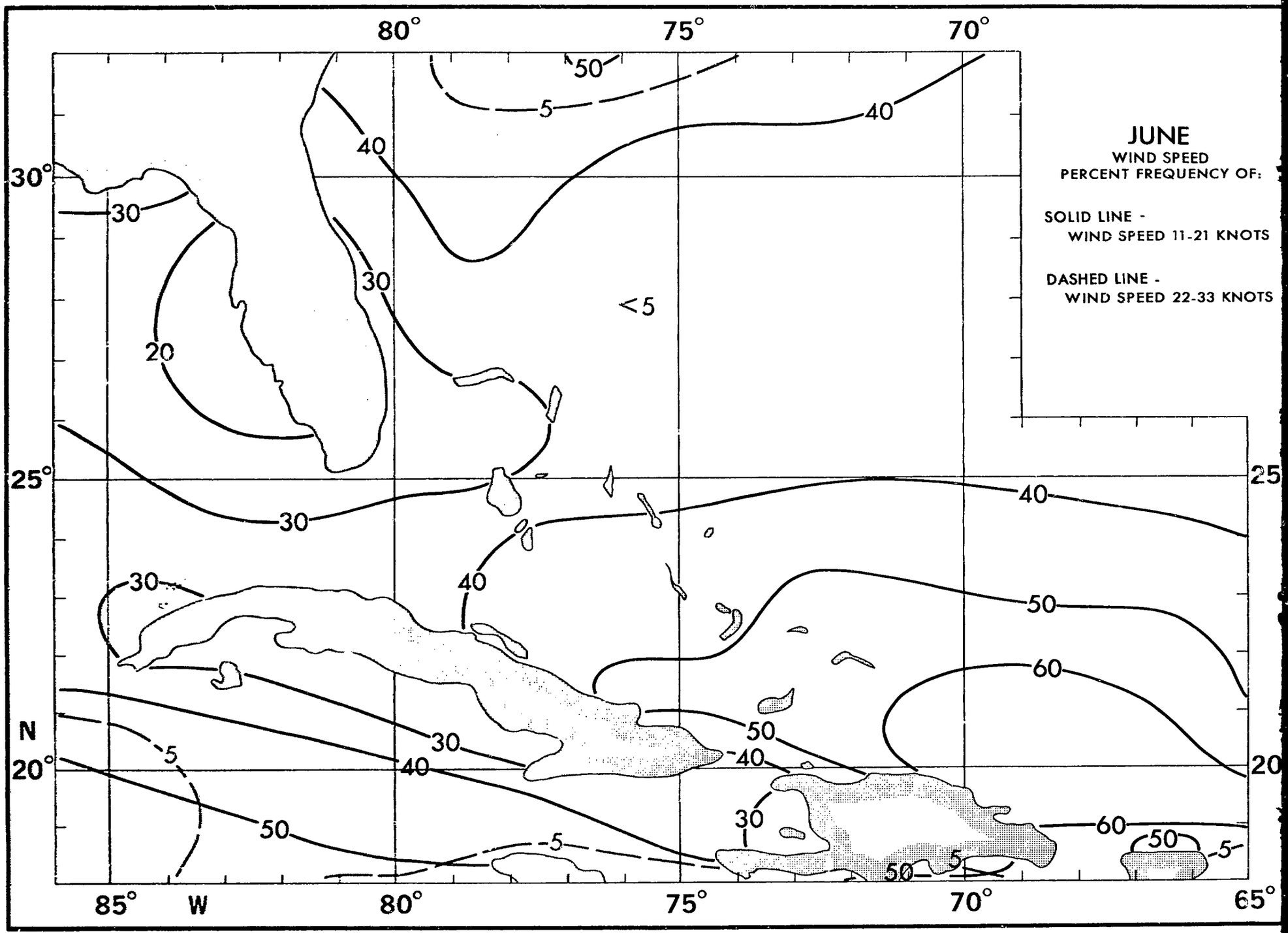

80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
65°
>10
40
30
20
10
JUNE
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES

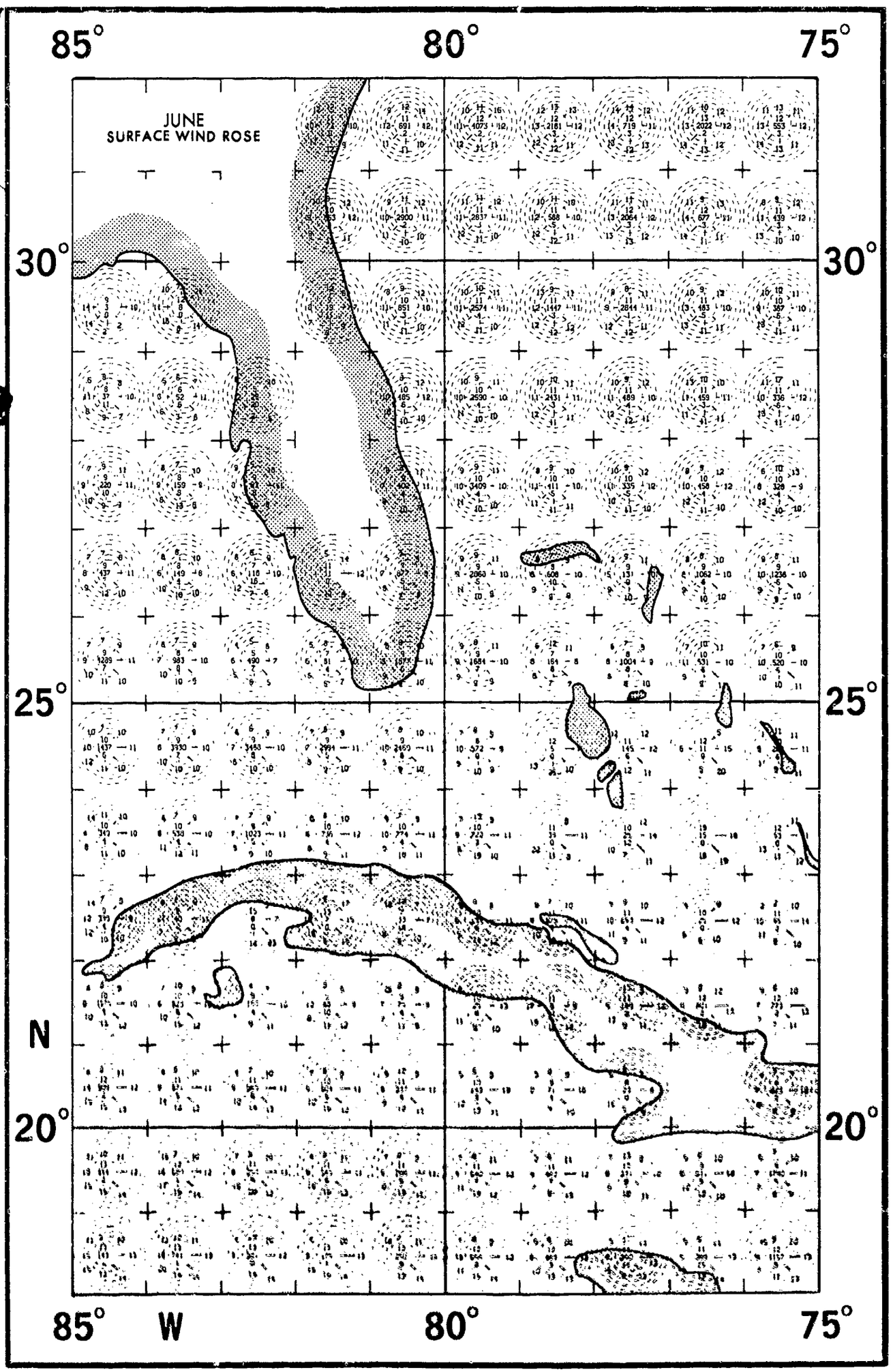

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
JUNE
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE -
CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES
<1
1
2
3
4

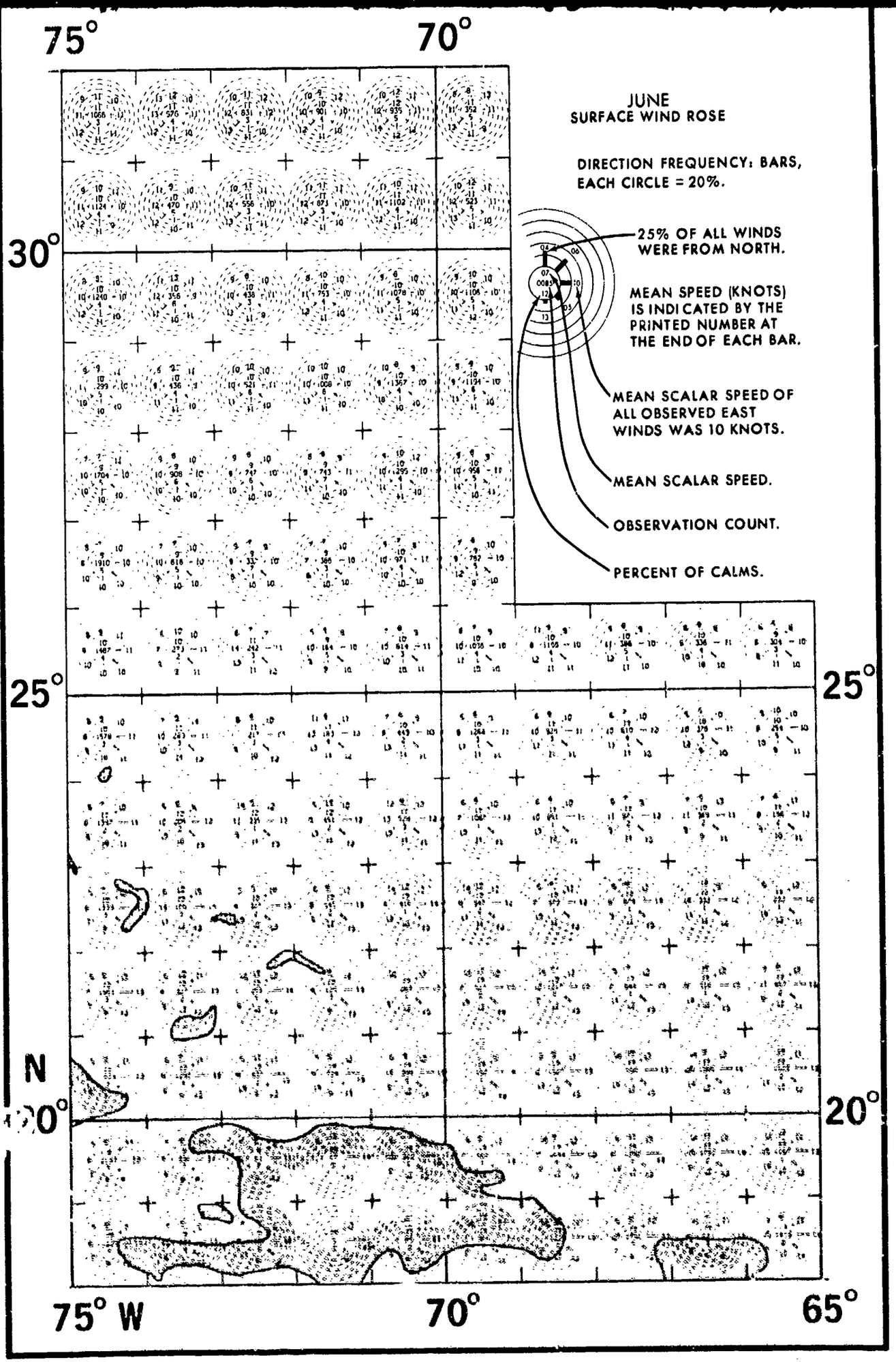

JUNE
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°

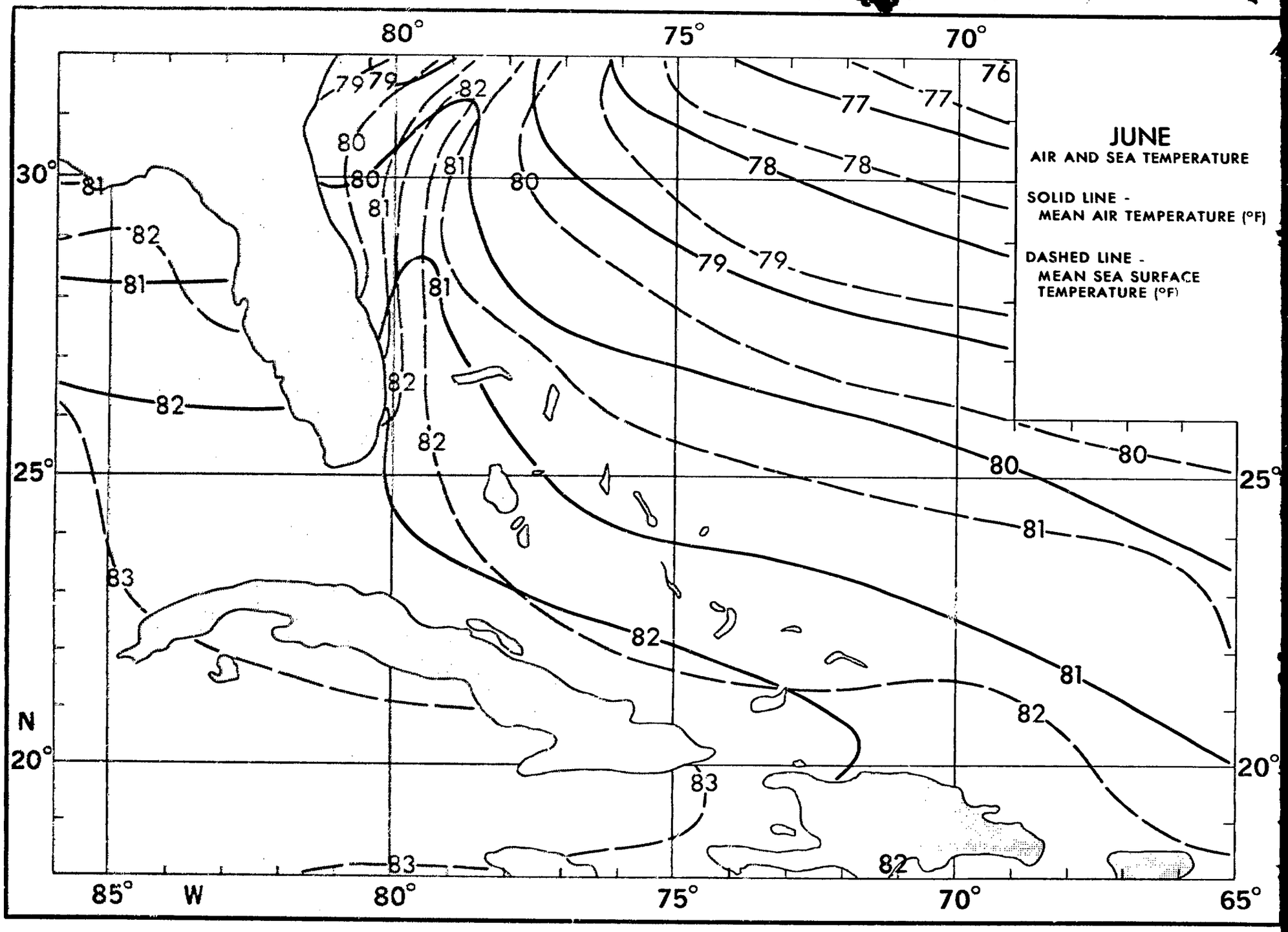

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
JUNE
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)
6
7
8
9
10
11
12
13
14

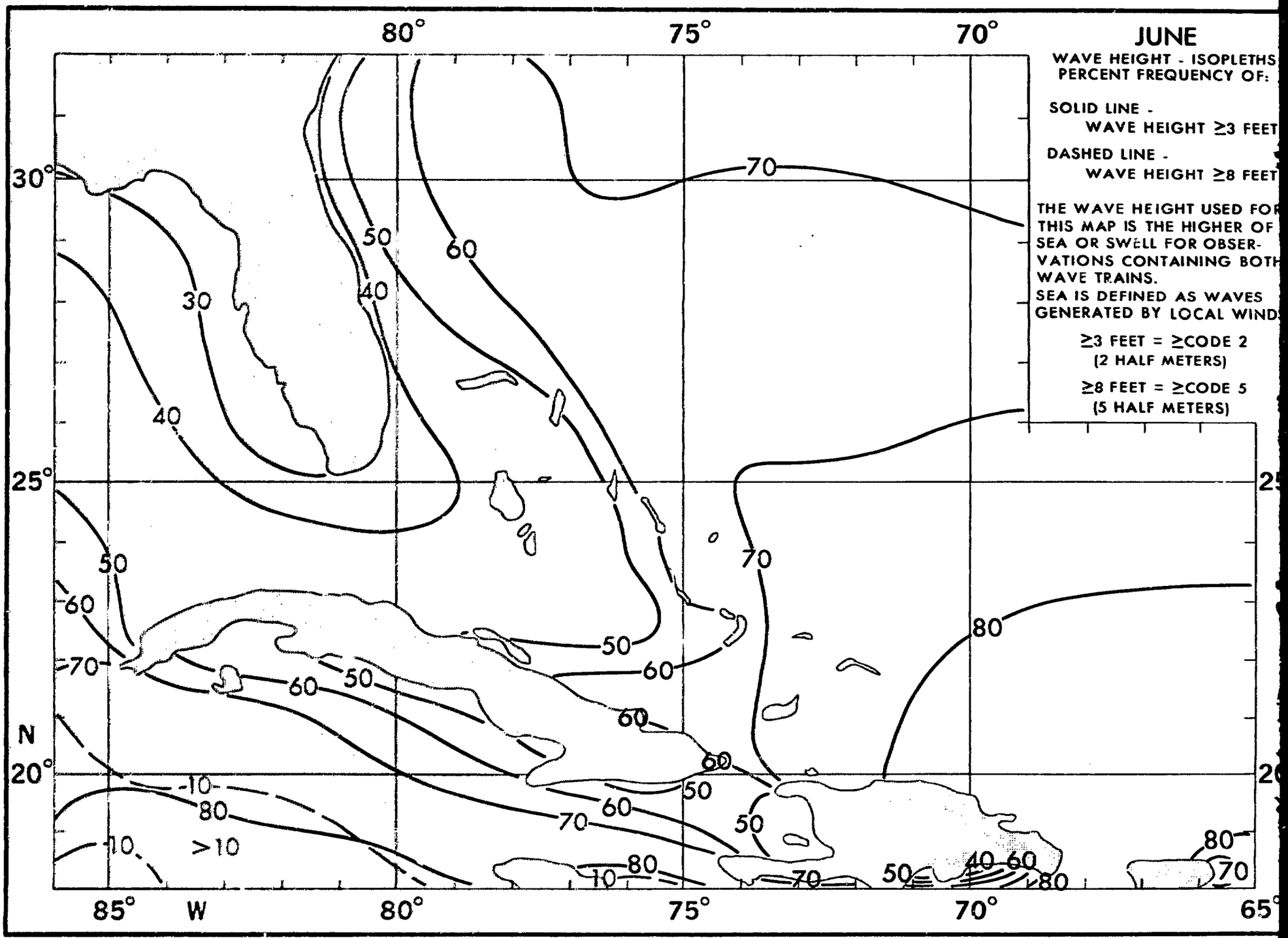

JUNE
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
60
50
70
80
<1
40
-30

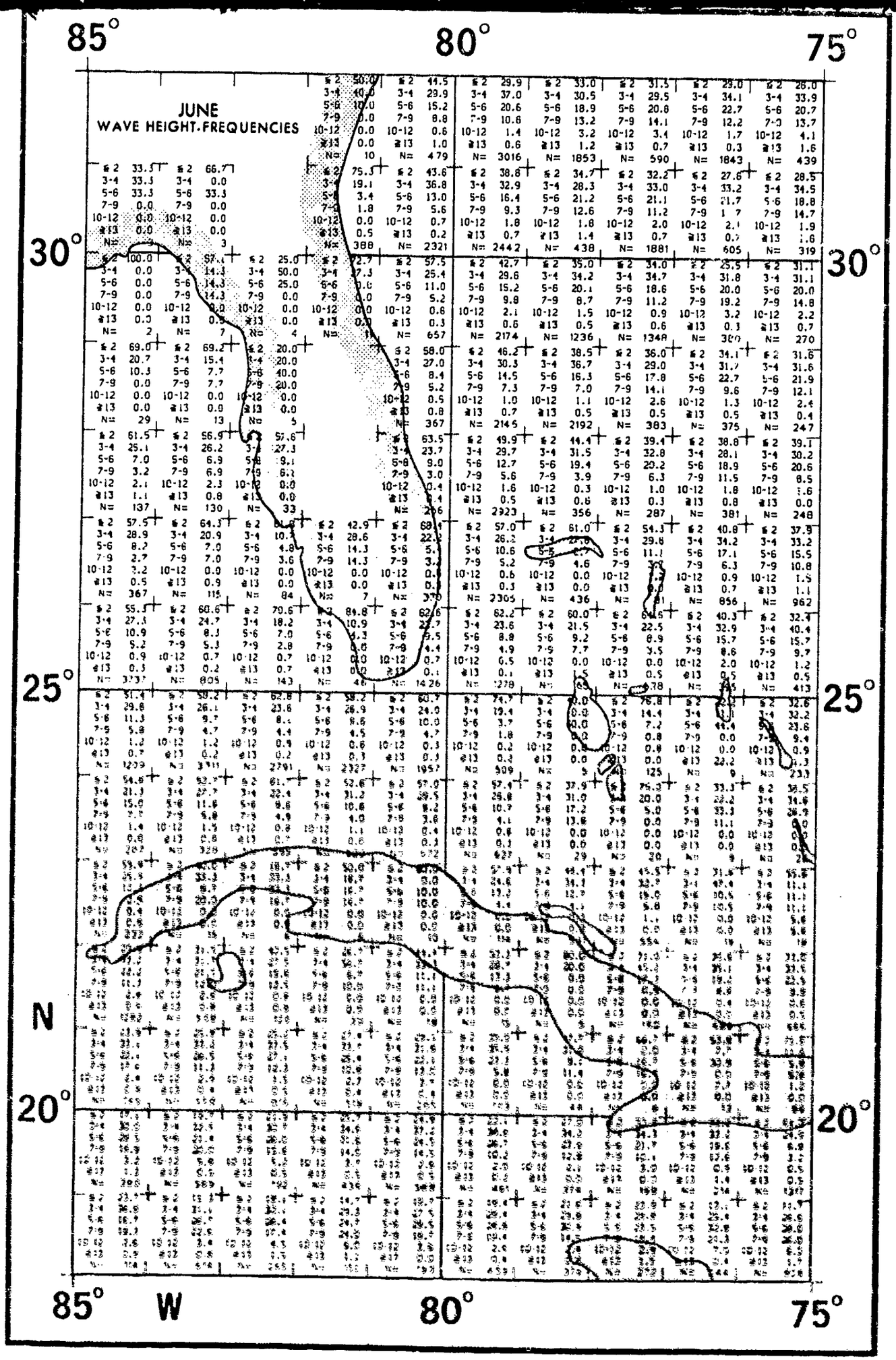

JUNE
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED 11-21 KNOTS
DASHED LINE -
WIND SPEED 22-33 KNOTS
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
<5
5
20
30
40
50
60

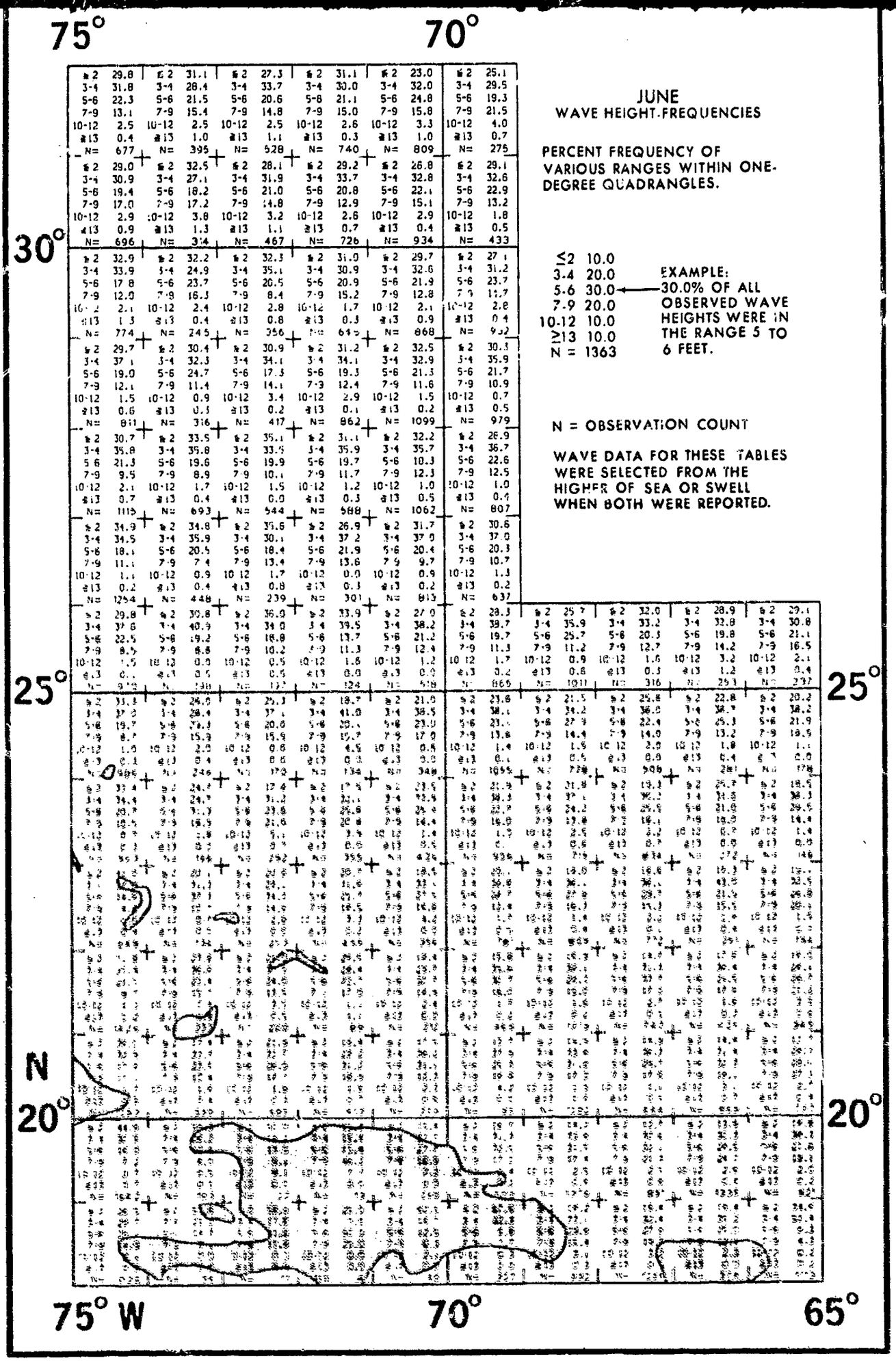

JUNE
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
W


75°
70°
30°
25°
20°
N
75° W
70°
65°
JUNE
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


JUNE
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
76
77
78
79
80
81
82
83


JUNE
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEET
DASHED LINE -
WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR
THIS MAP IS THE HIGHER OF
SEA OR SWELL FOR OBSER-
VATIONS CONTAINING BOTH
WAVE TRAINS.
SEA IS DEFINED AS WAVES
GENERATED BY LOCAL WINDS
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
>10


JUNE
WAVE HEIGHT-FREQUENCIES
85°
80°
75°
30°
25°
20°
N
W



JUNE
WAVE HEIGHT-FREQUENCIES

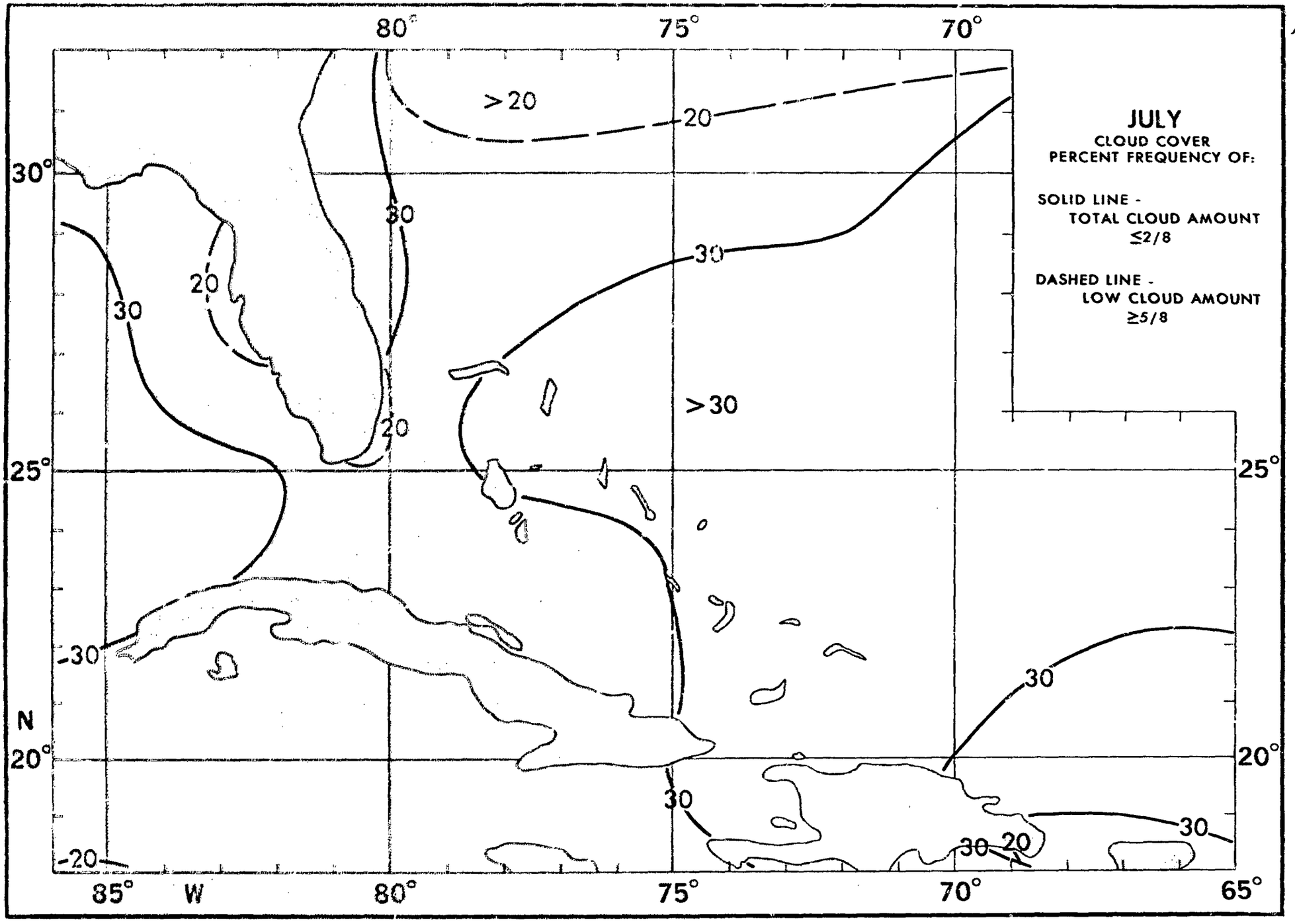
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

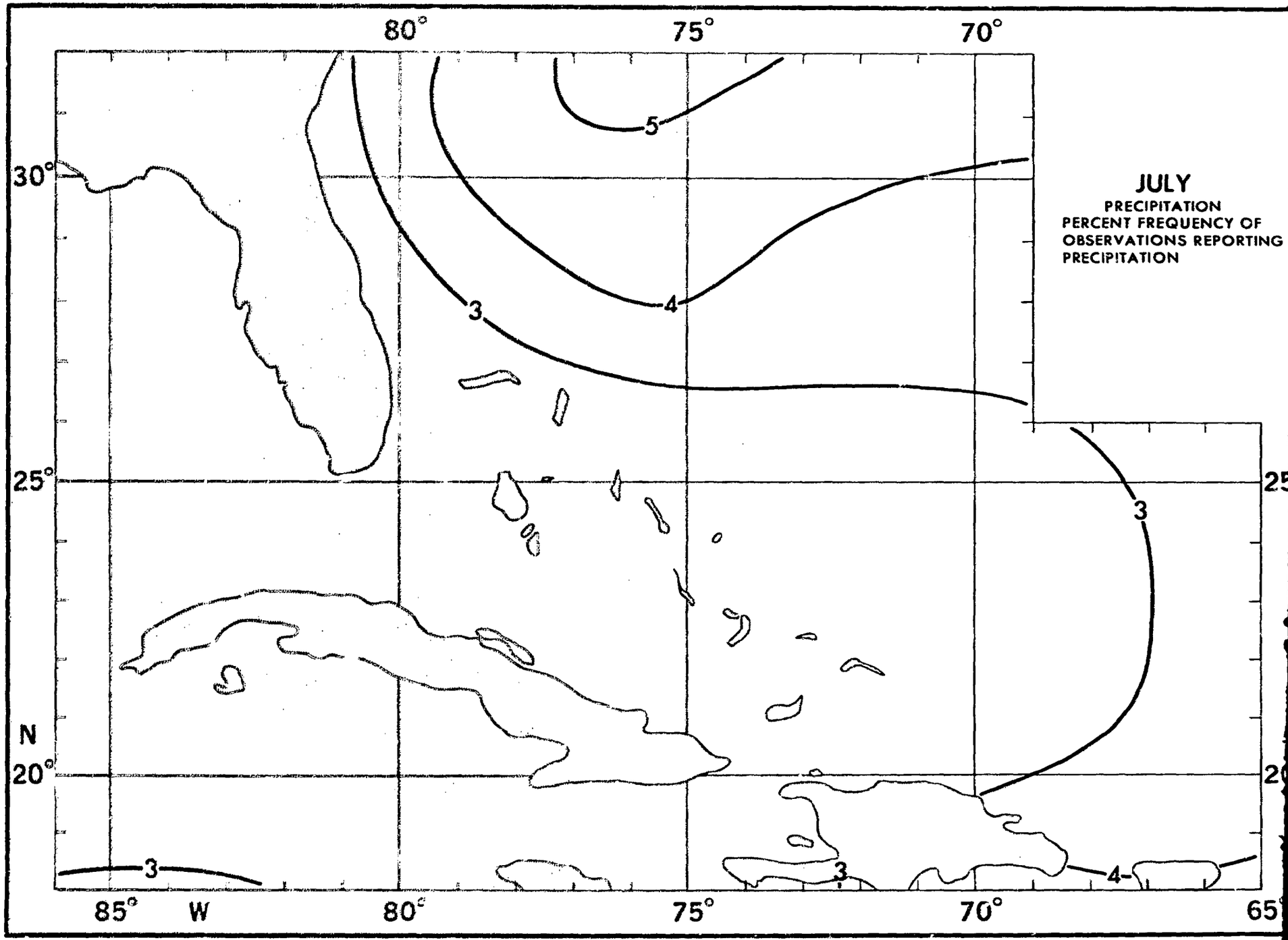
≤2	10.0
3-4	20.0
5-6	30.0
7-9	20.0
10-12	10.0
≥13	10.0
N =	1363

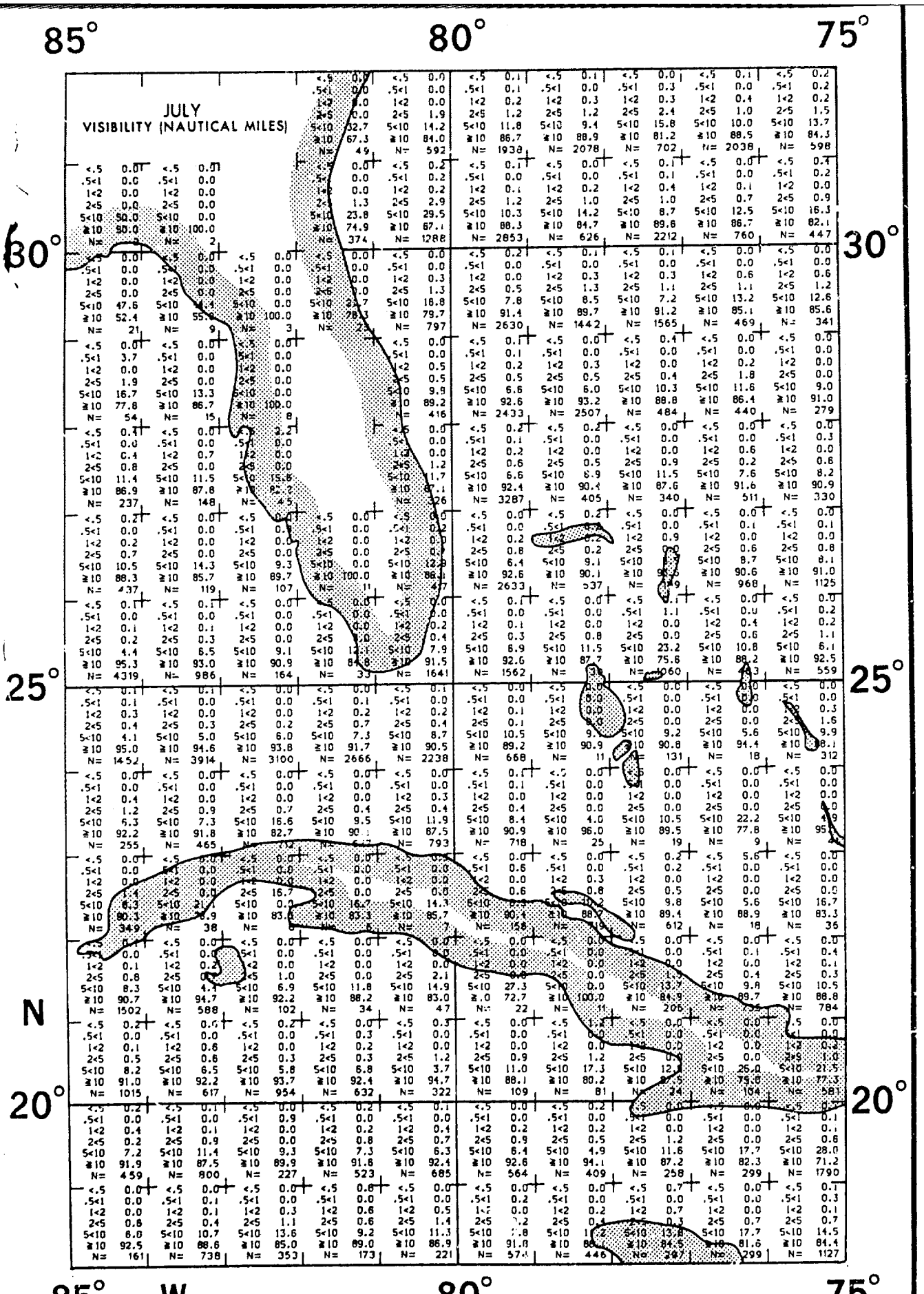
EXAMPLE: 30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.

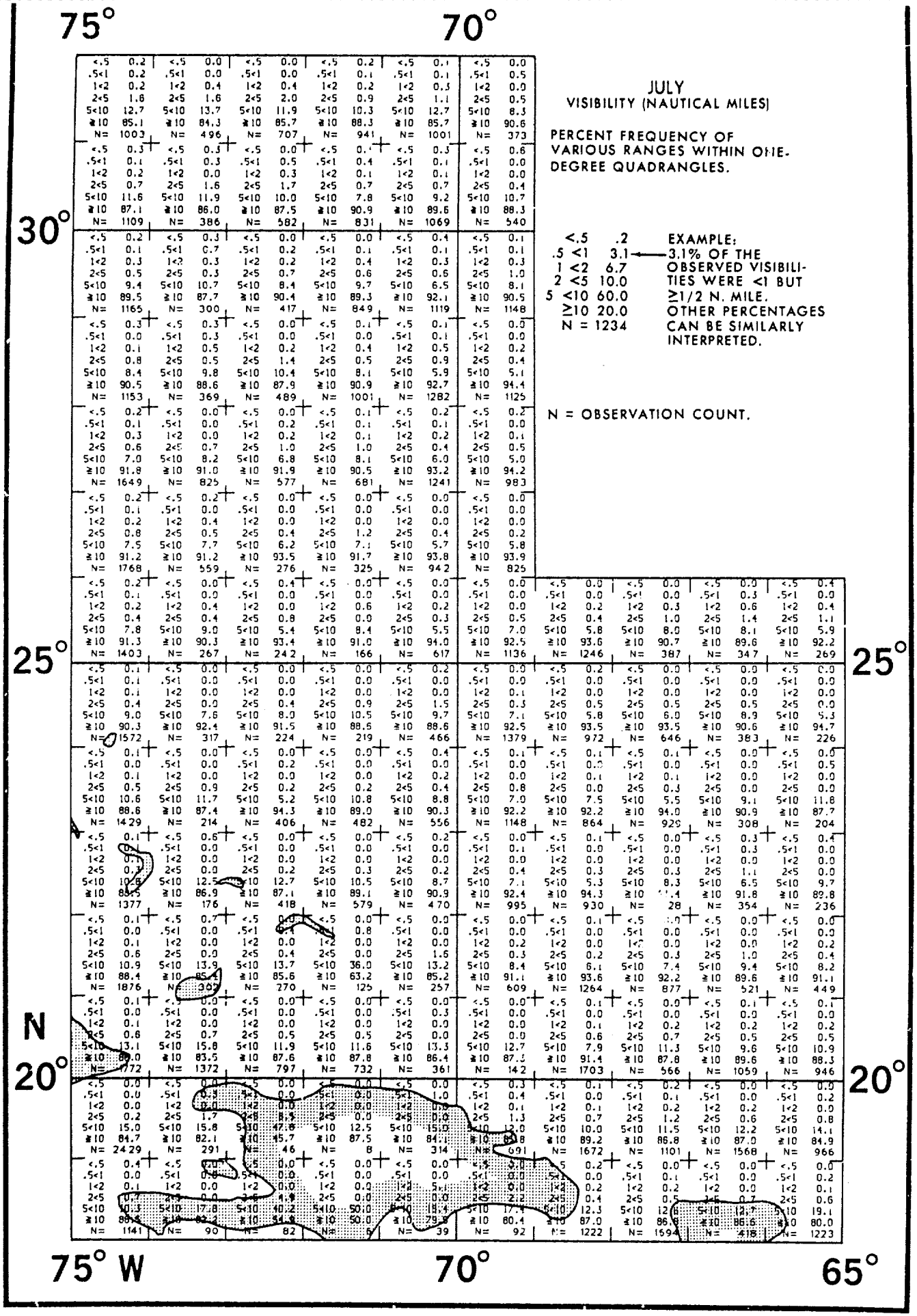
N = OBSERVATION COUNT

WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
>20
20
30
>30
-20
-30
JULY
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/8


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
5
4
3
3
3
3
4
JULY
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION


JULY
VISIBILITY (NAUTICAL MILES)
85°
80°
75°
30°
25°
20°
N
W

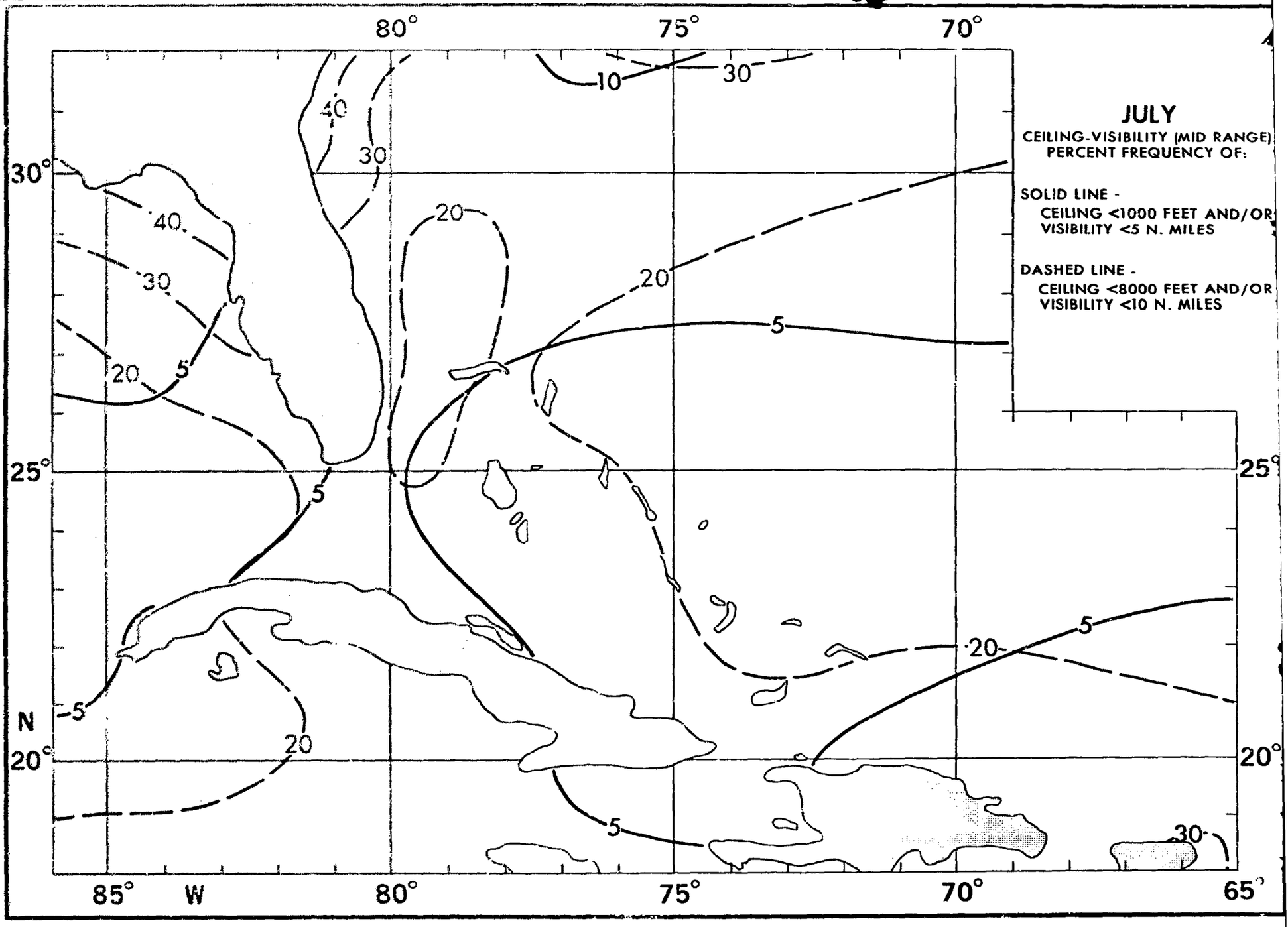


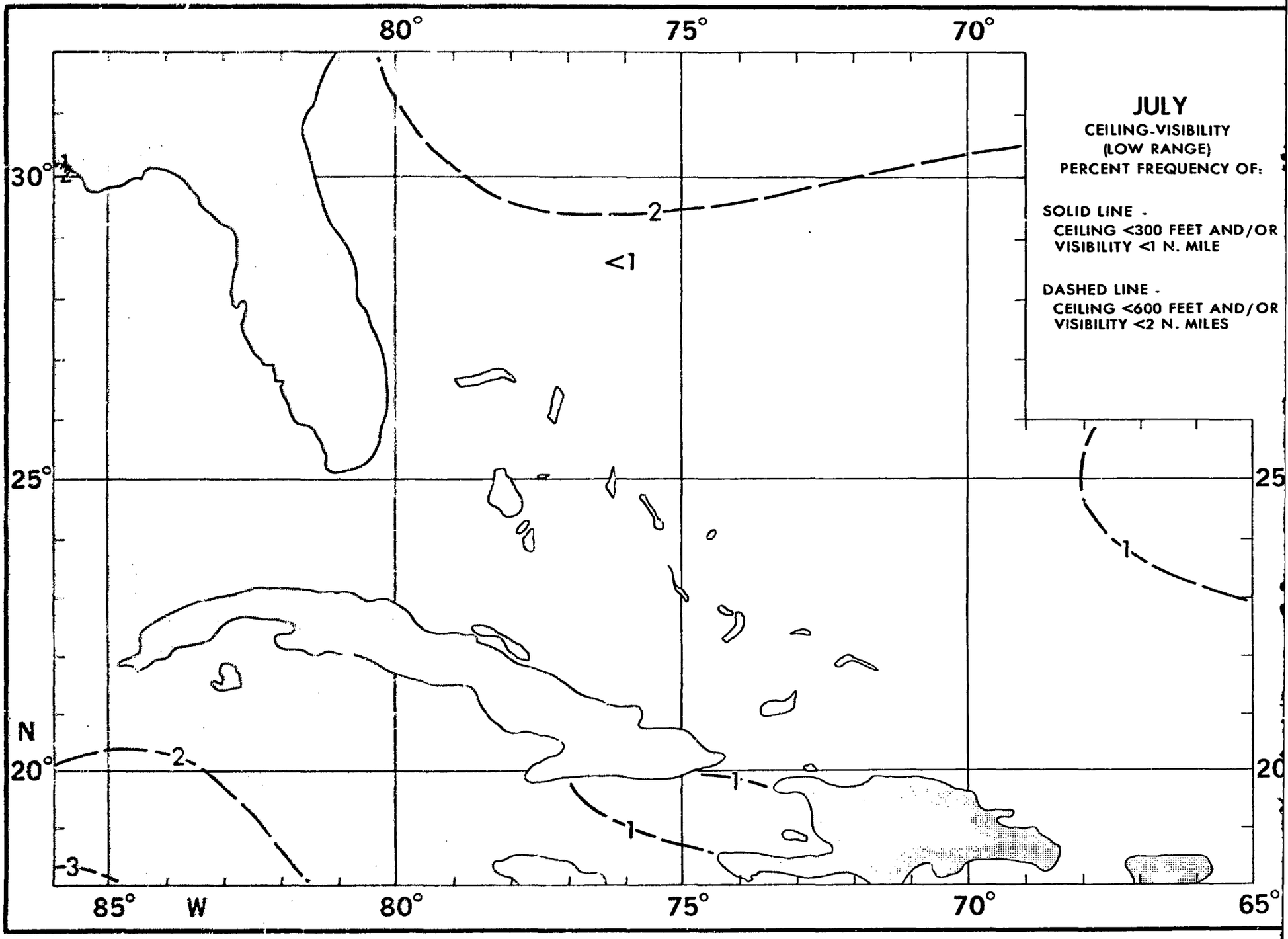
JULY
VISIBILITY (NAUTICAL MILES)

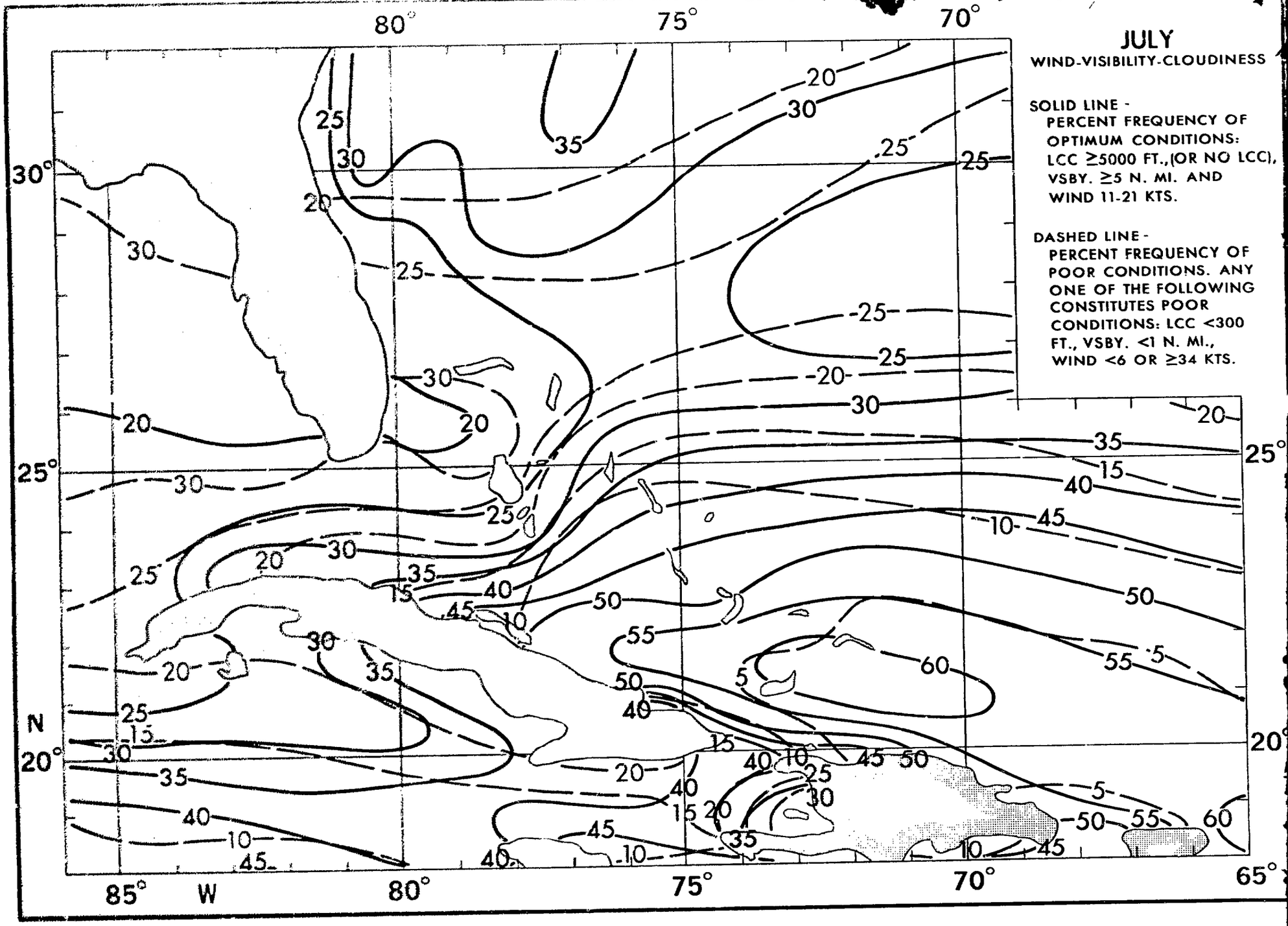
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

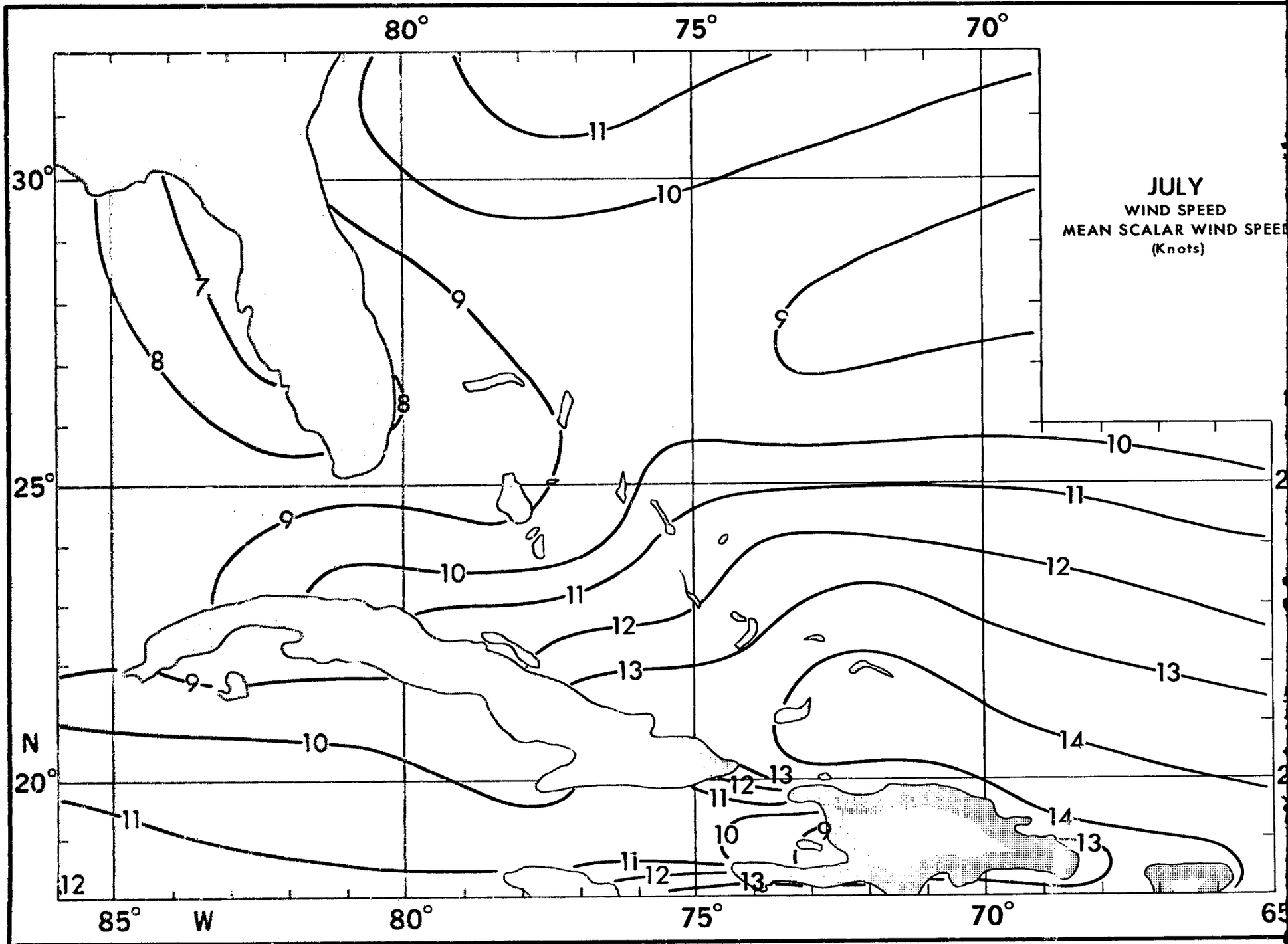
<.5	.2	EXAMPLE:
.5 <1	3.1	← 3.1% OF THE
1 <2	6.7	OBSERVED VISIBILI-
2 <5	10.0	TIES WERE <1 BUT
5 <10	60.0	≥1/2 N. MILE.
≥10	20.0	OTHER PERCENTAGES
N =	1234	CAN BE SIMILARLY INTERPRETED.

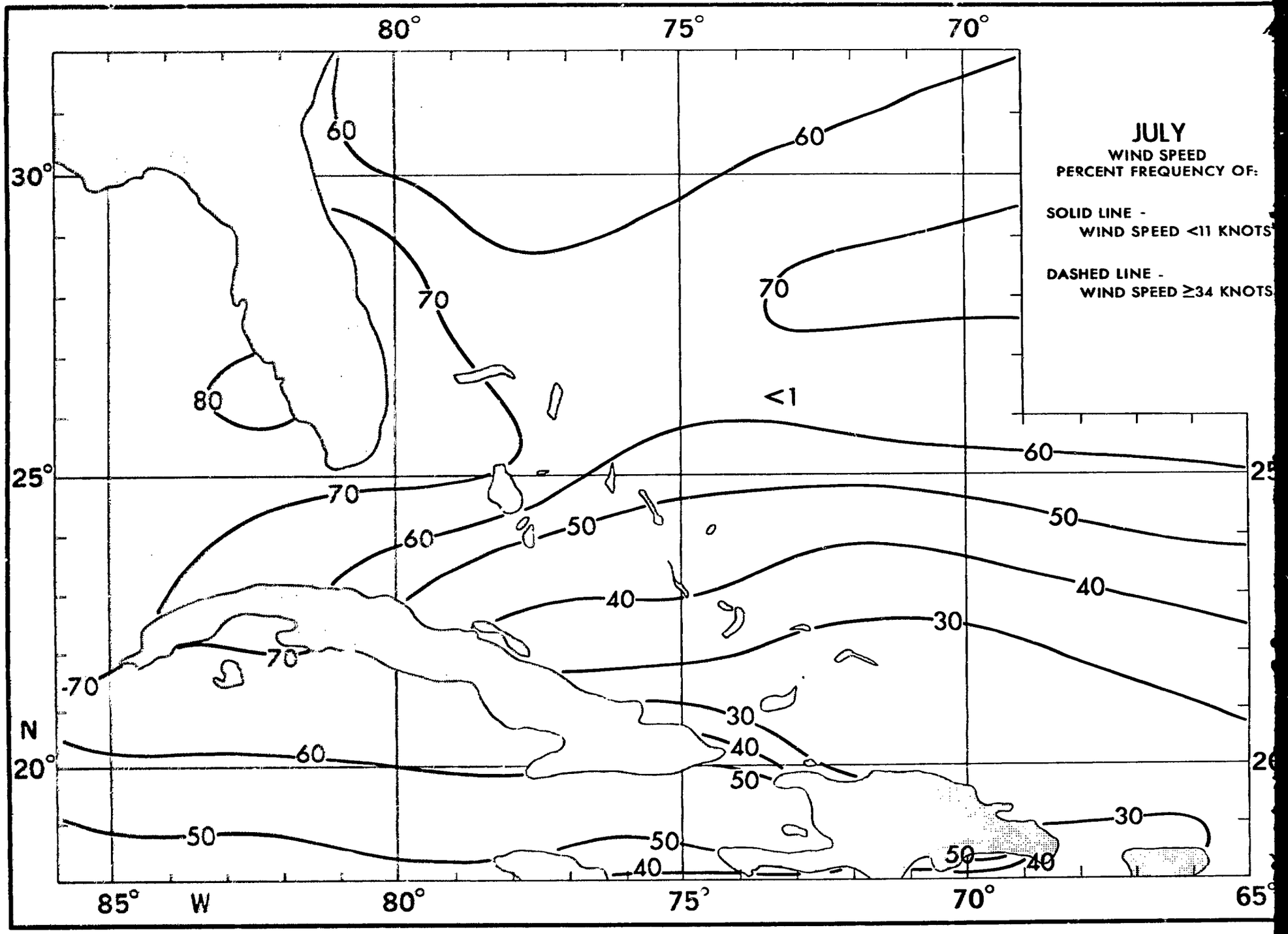
N = OBSERVATION COUNT.

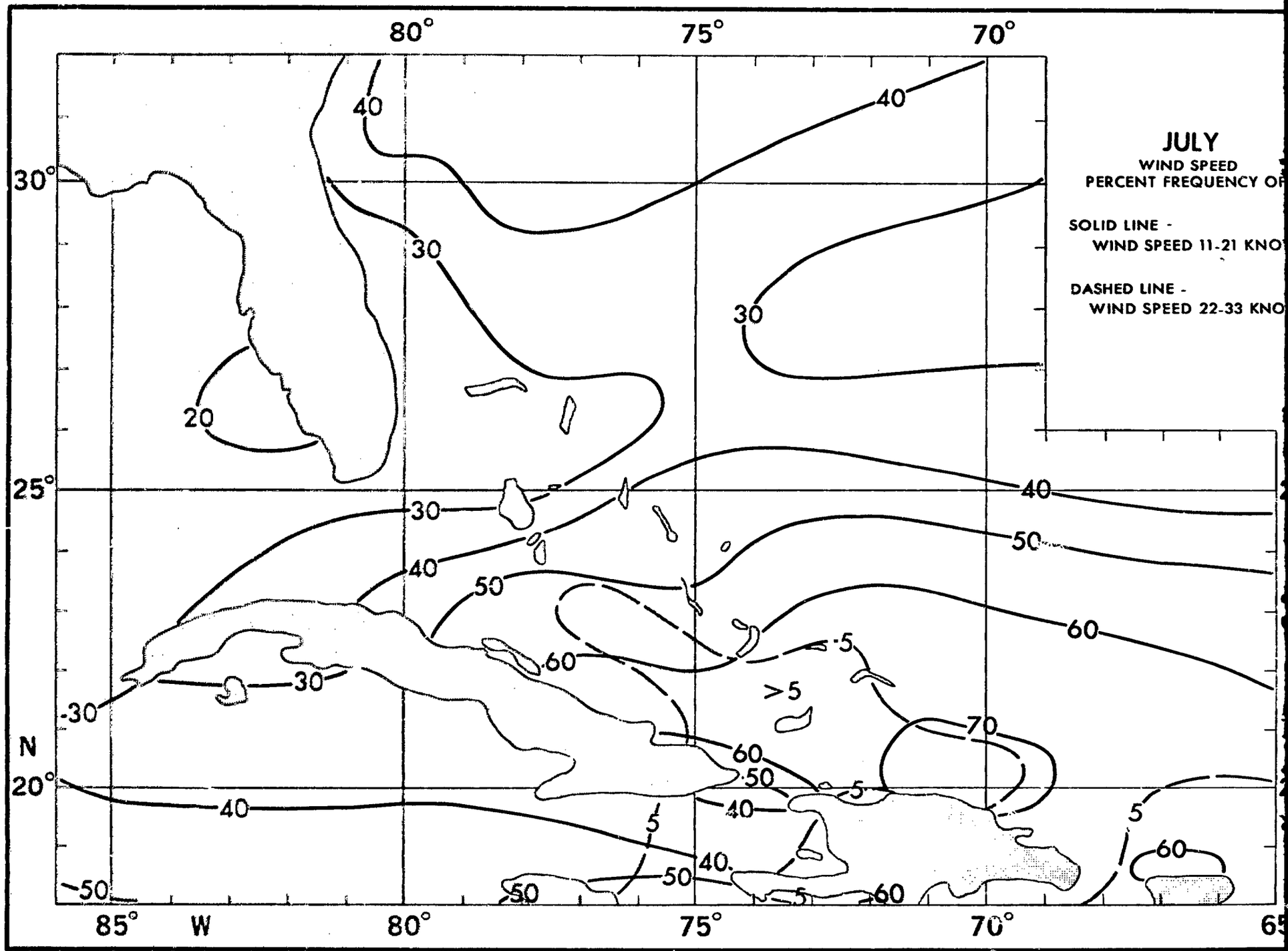

JULY
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
10
30
40
30
20
40
30
20
5
20
5
5
20
5
5
30

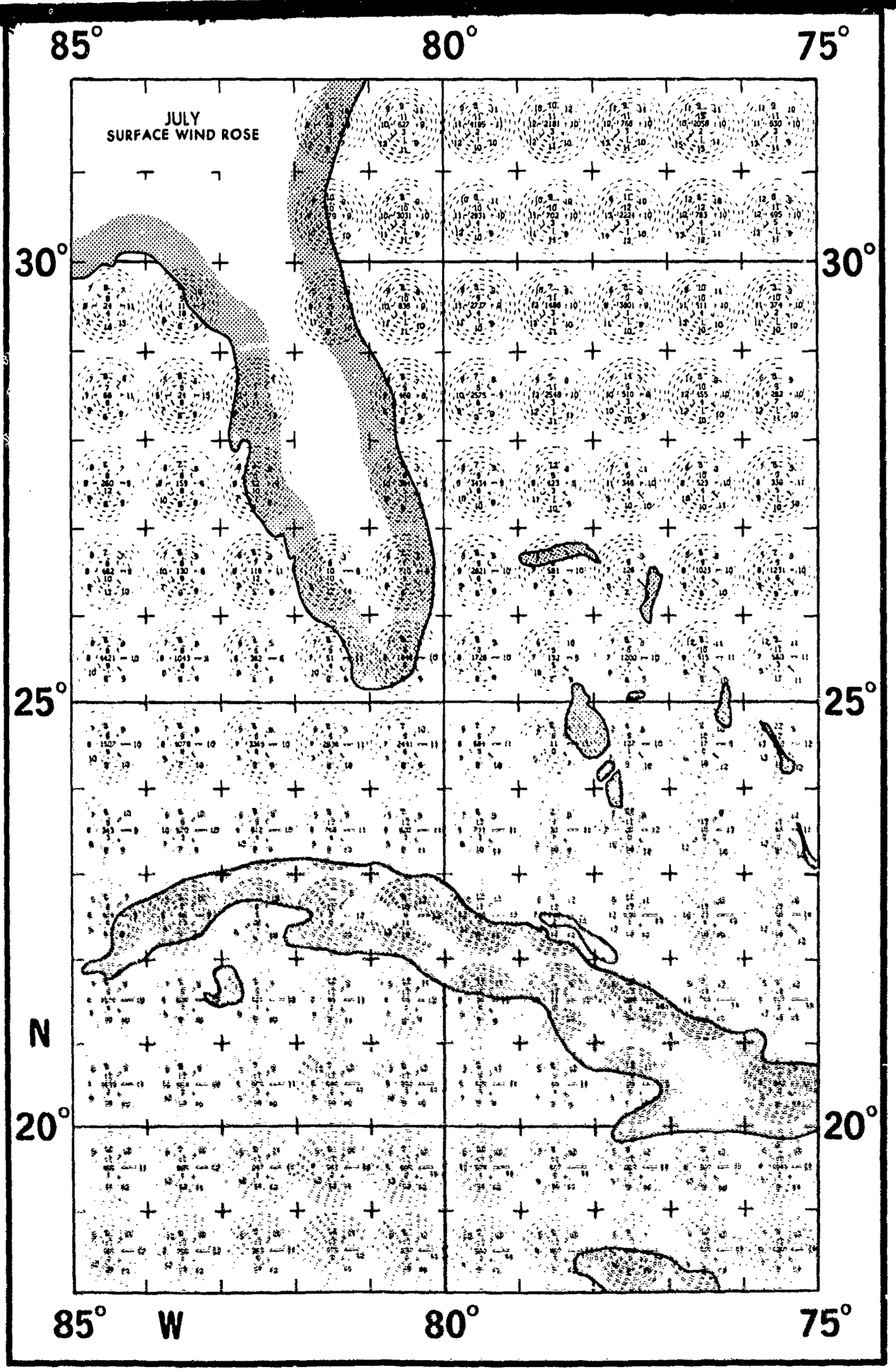

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
JULY
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE -
CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES
<1
1
2
3

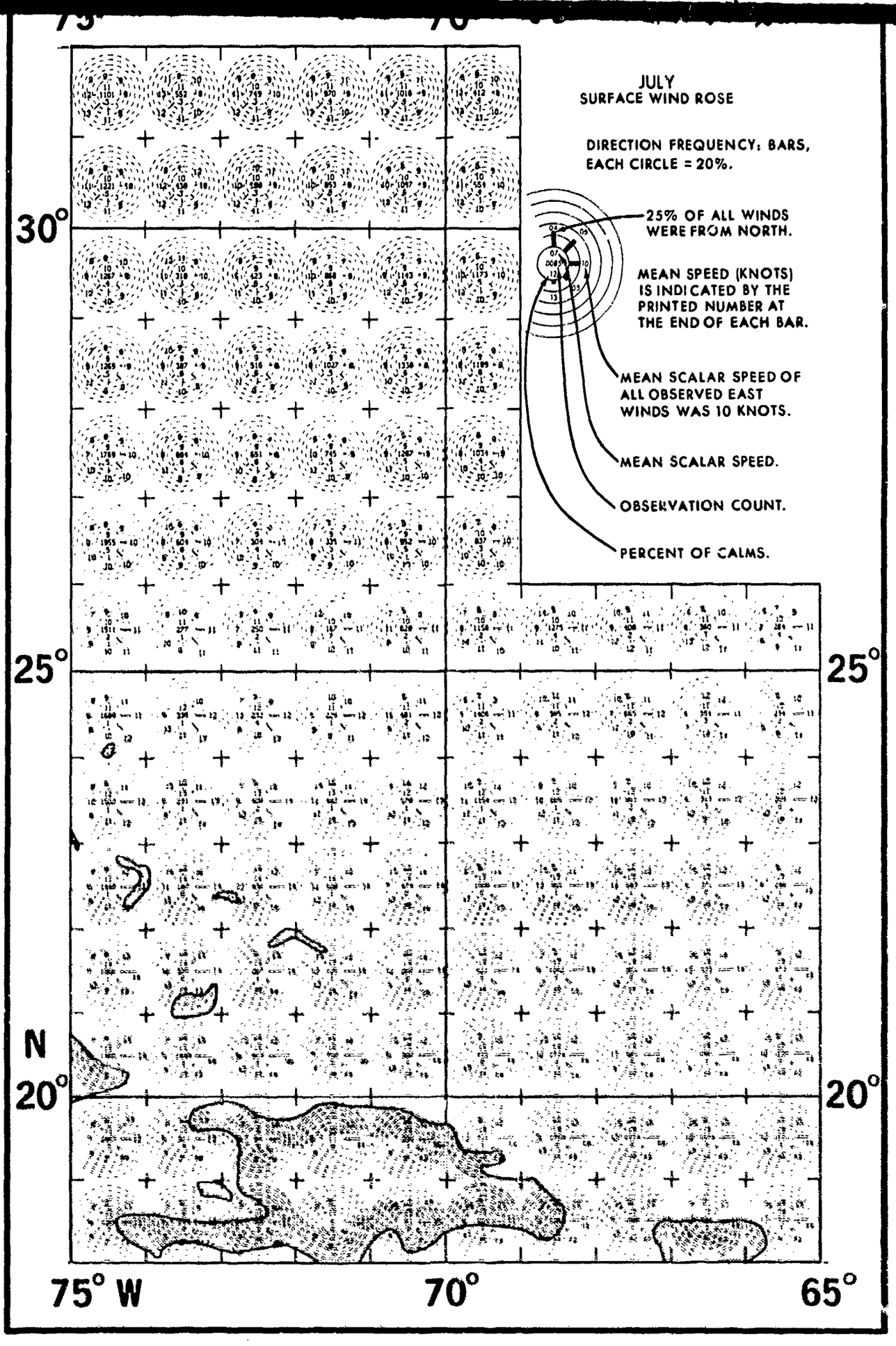

JULY
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
85° W
80°
75°
70°
65°
30°
25°
20°
N

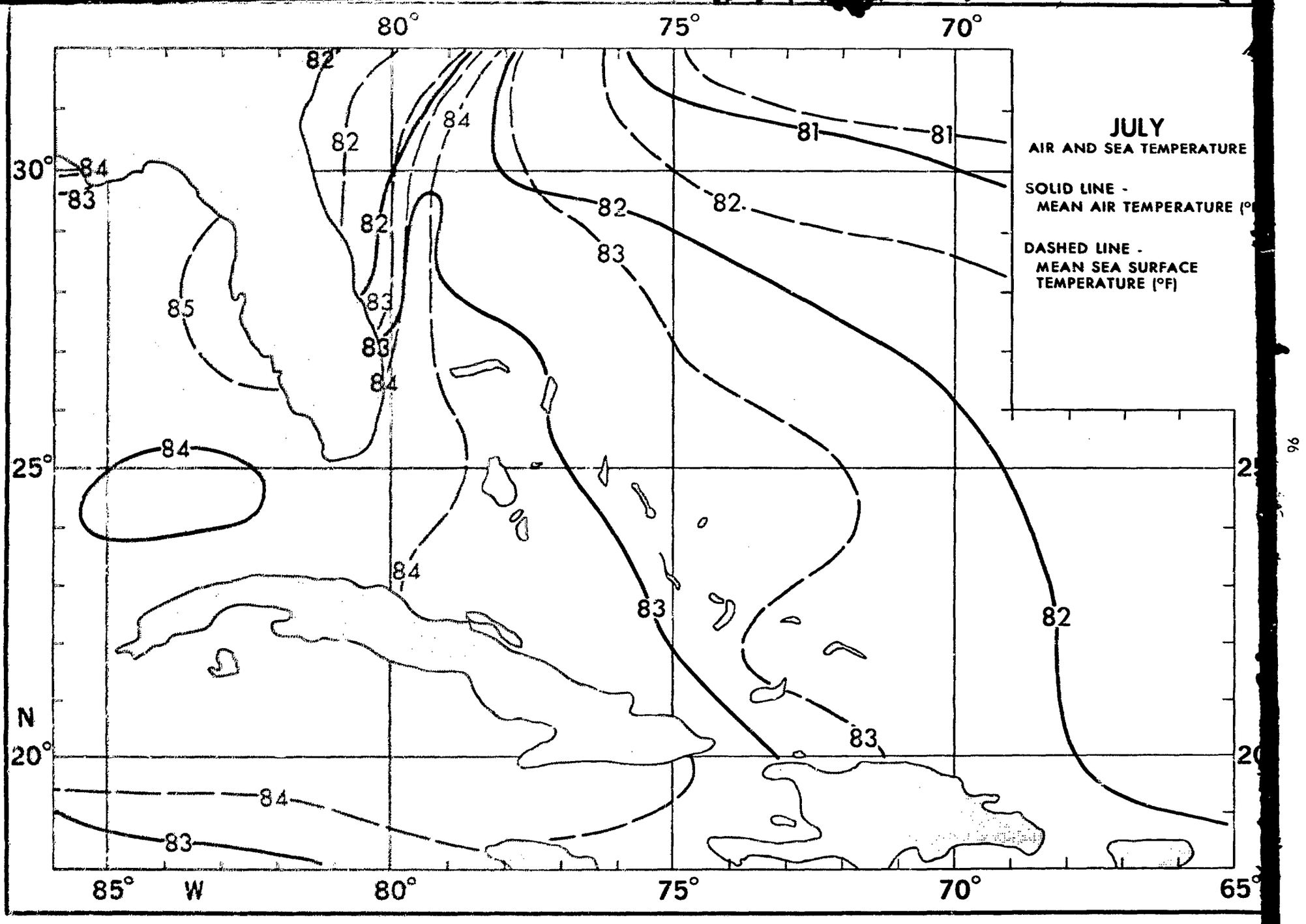

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65
JULY
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)
7
8
9
10
11
12
13
14

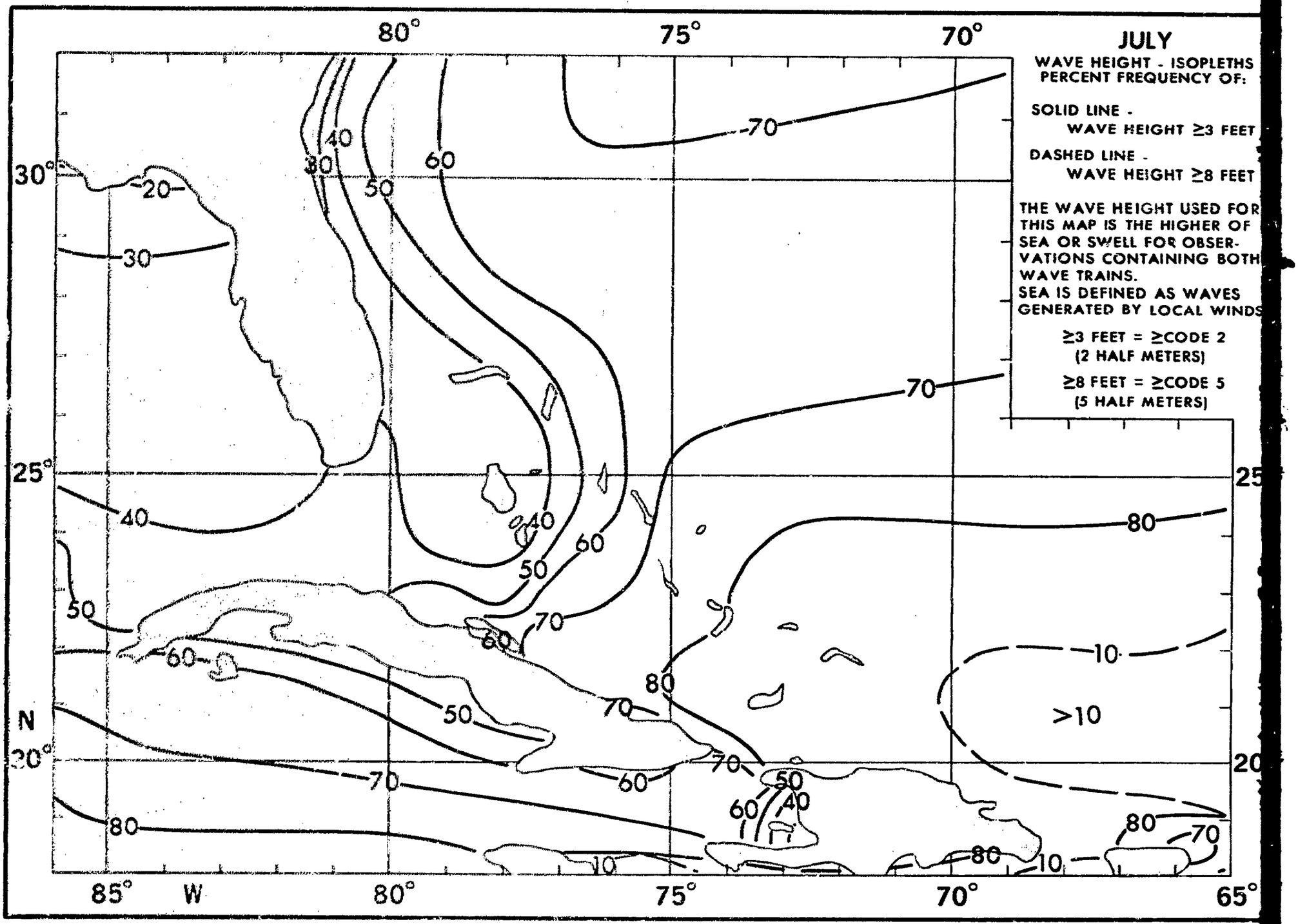

JULY
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS
85° W
80°
75°
70°
65°
30°
25°
20° N
<1
80
70
60
50
40
30

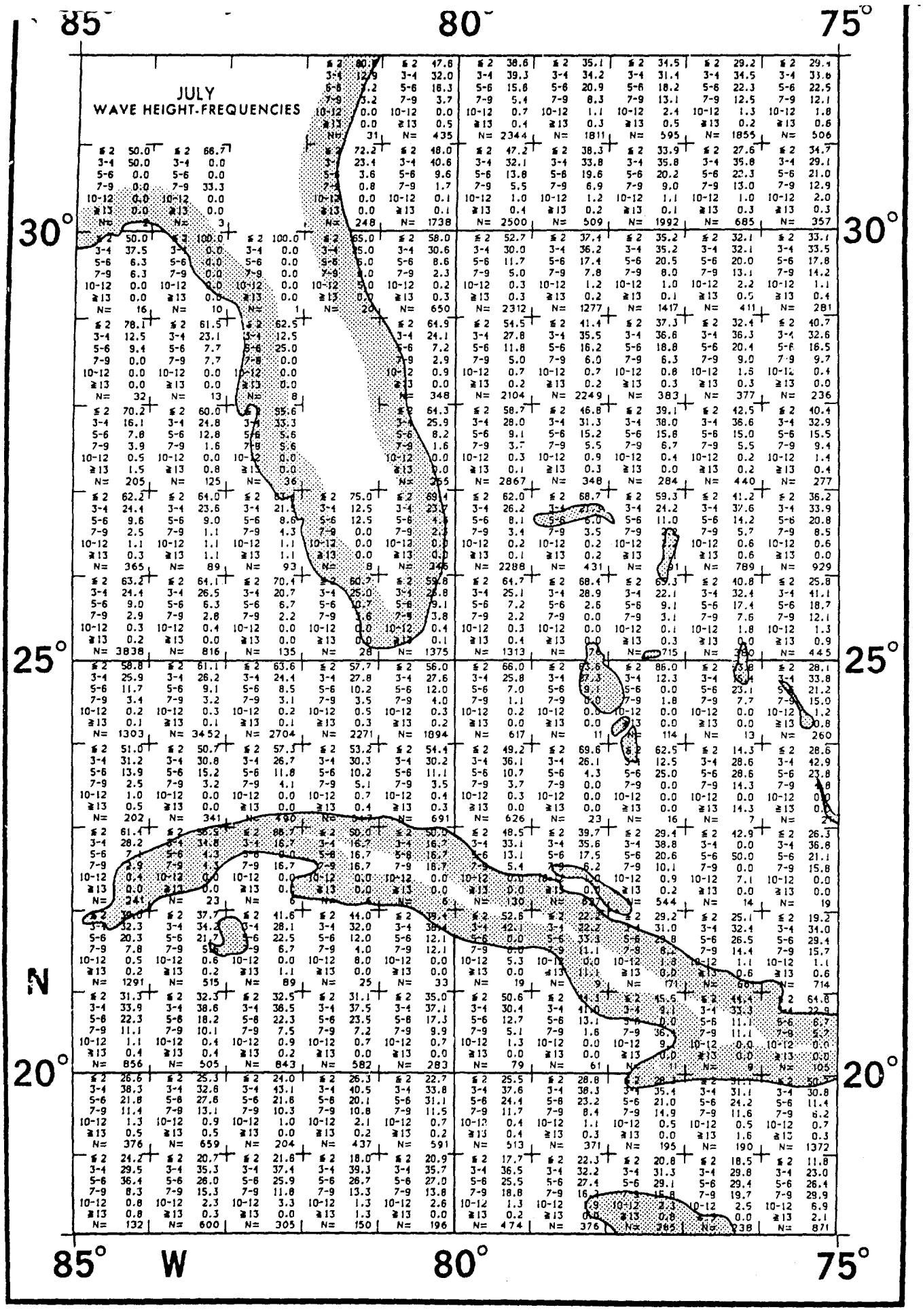

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65
JULY
WIND SPEED
PERCENT FREQUENCY OF
SOLID LINE -
WIND SPEED 11-21 KNO
DASHED LINE -
WIND SPEED 22-33 KNO
40
30
20
50
60
70
5
>5
-30
-50

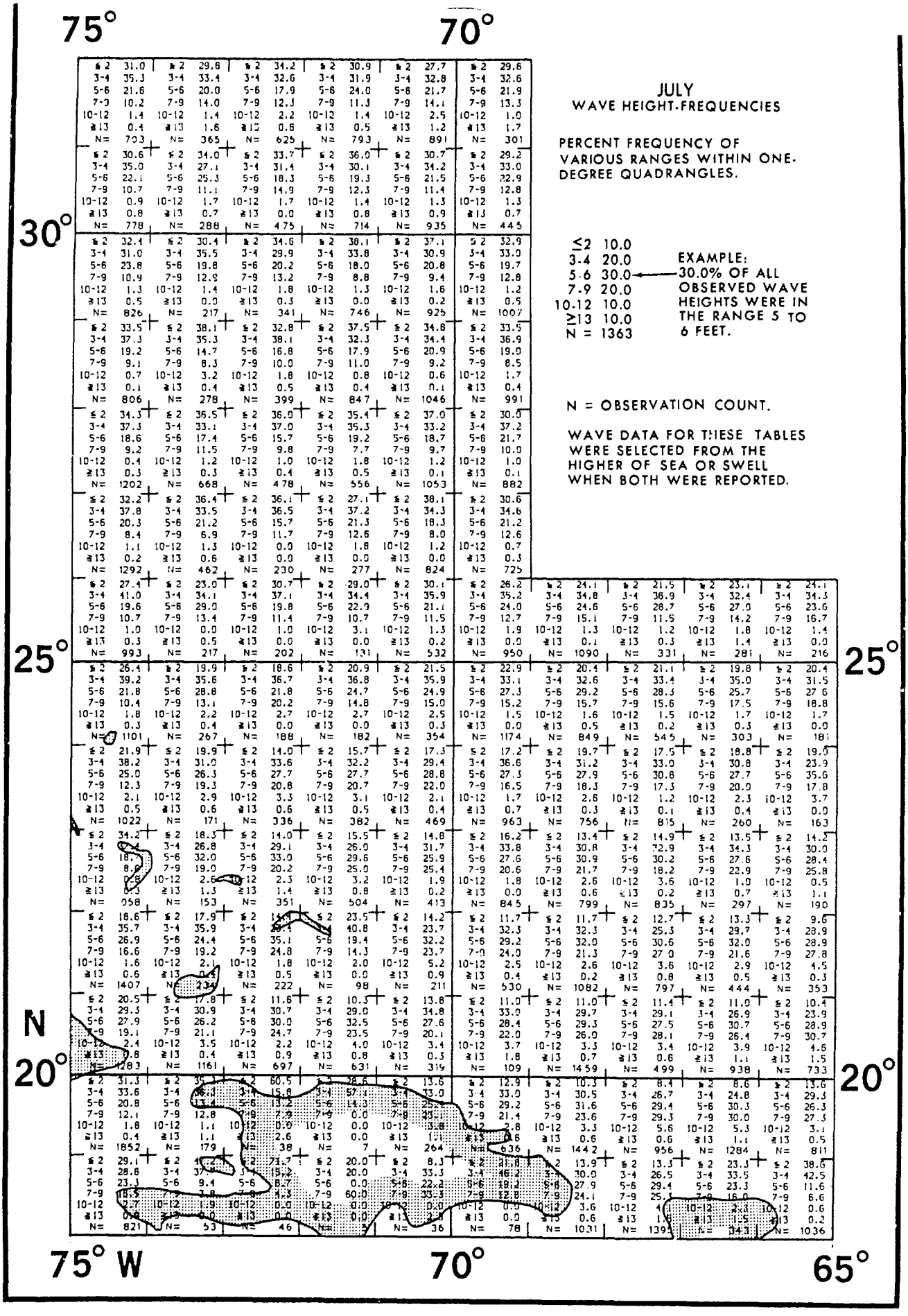

JULY
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
W

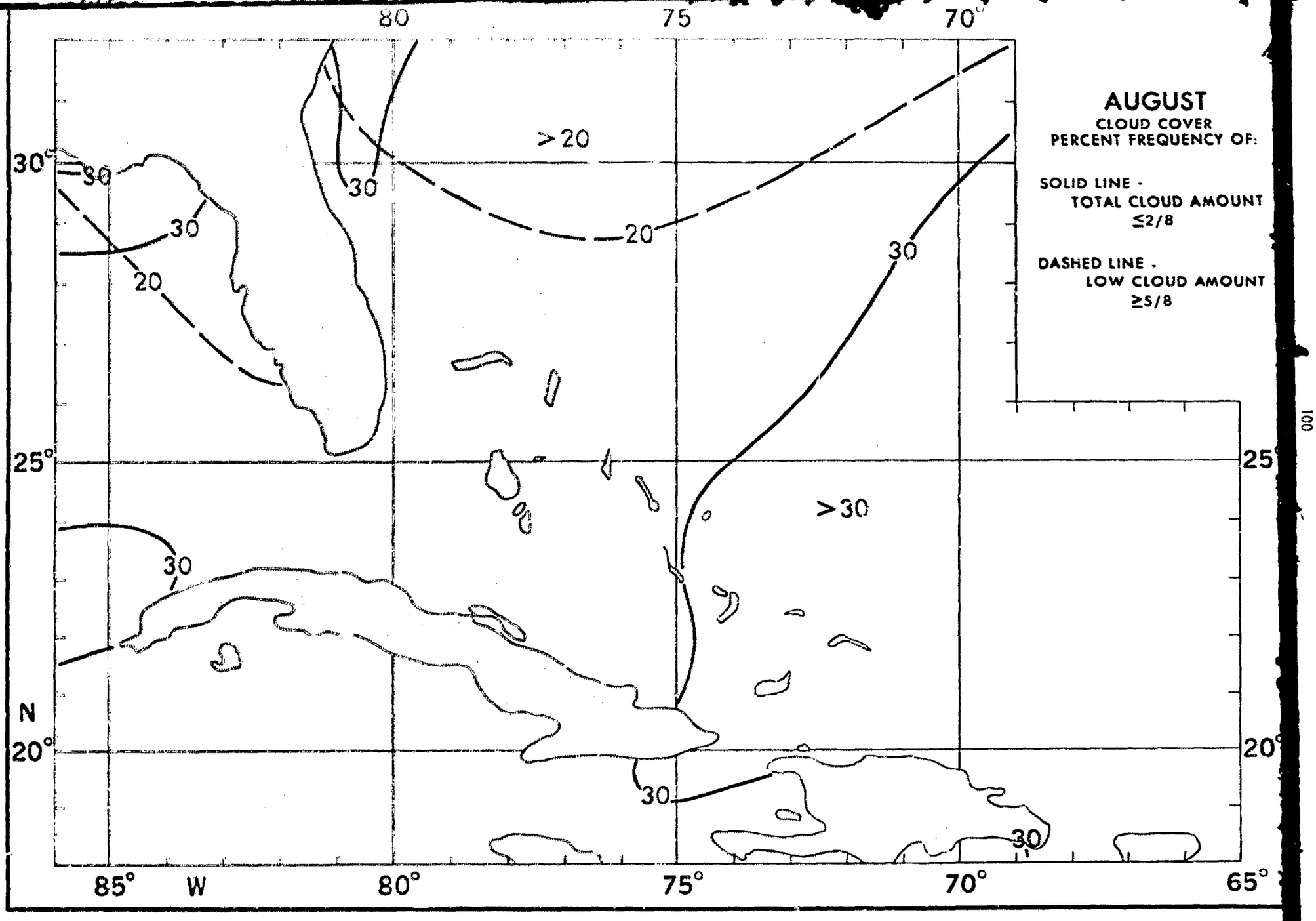

JULY
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.
30°
25°
20°
N
75° W
70°
65°

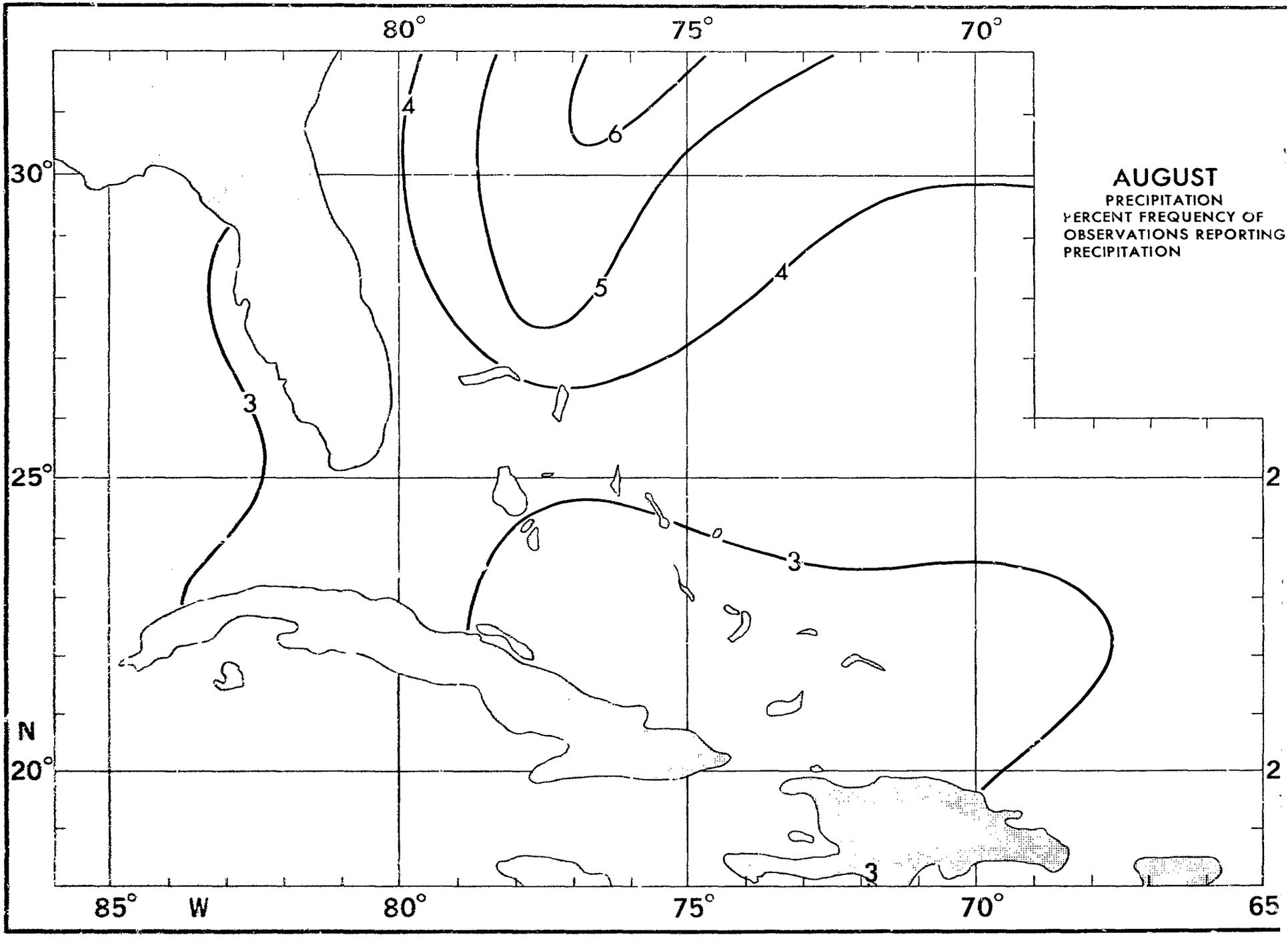

JULY
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
82
84
81
81
82
82
82
83
85
83
83
84
84
84
83
82
83
84
83

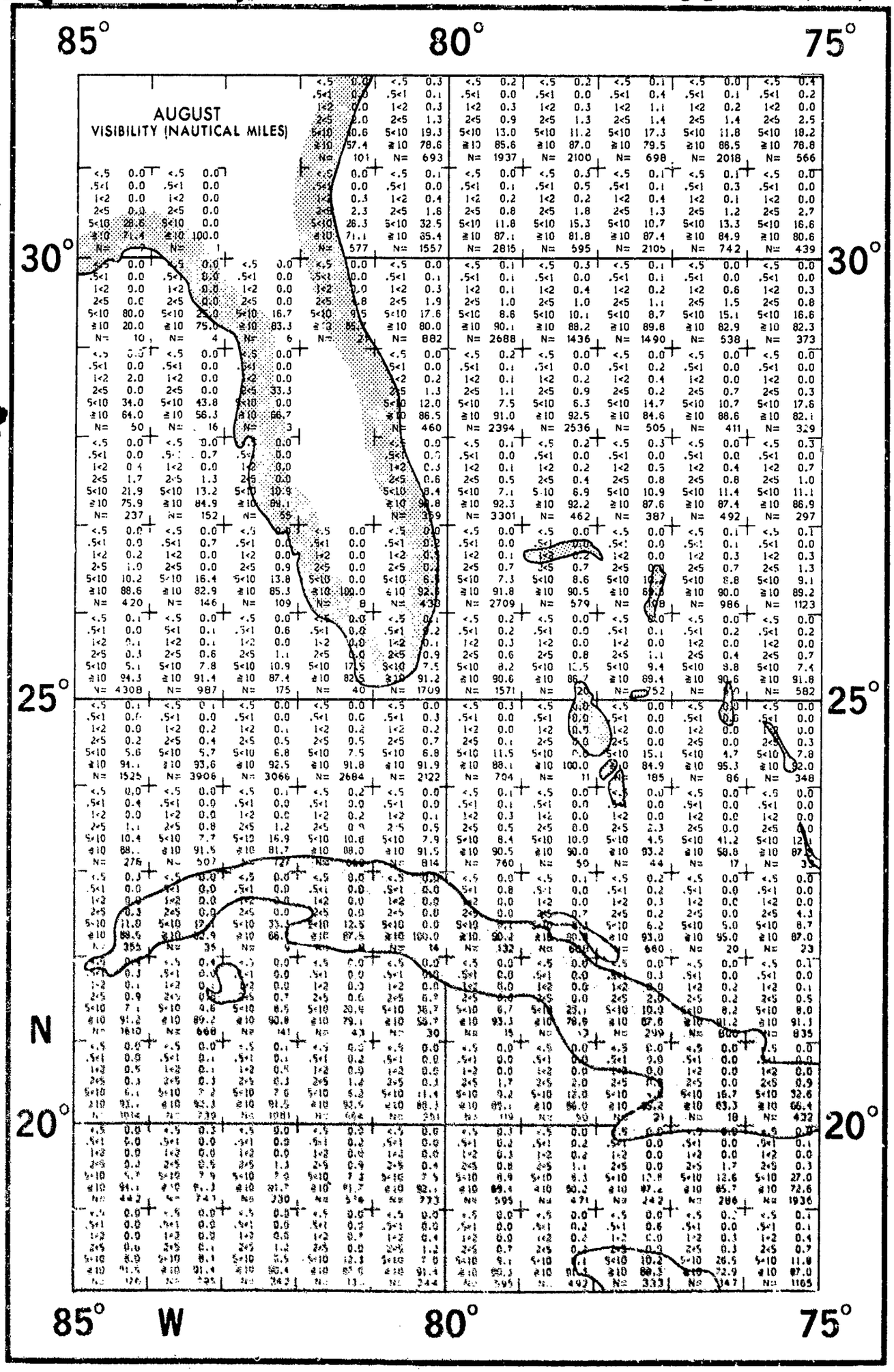

JULY
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEET
DASHED LINE -
WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
>10
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°


JULY
WAVE HEIGHT-FREQUENCIES
85°
80°
75°
30°
25°
20°
N
85° W
80°
75°


75°
70°
30°
25°
20°
N
75° W
70°
65°
JULY
WAVE HEIGHT-FREQUENCIES
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
≤2 10.0
3-4 20.0
5-6 30.0
7-9 20.0
10-12 10.0
≥13 10.0
N = 1363
EXAMPLE:
30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.
N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


AUGUST
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/8
80
75
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
>20
>30
30
20


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65
AUGUST
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION
6
4
5
4
3
3
3
2
2


AUGUST
VISIBILITY (NAUTICAL MILES)
85°
80°
75°
30°
25°
20°
N
W

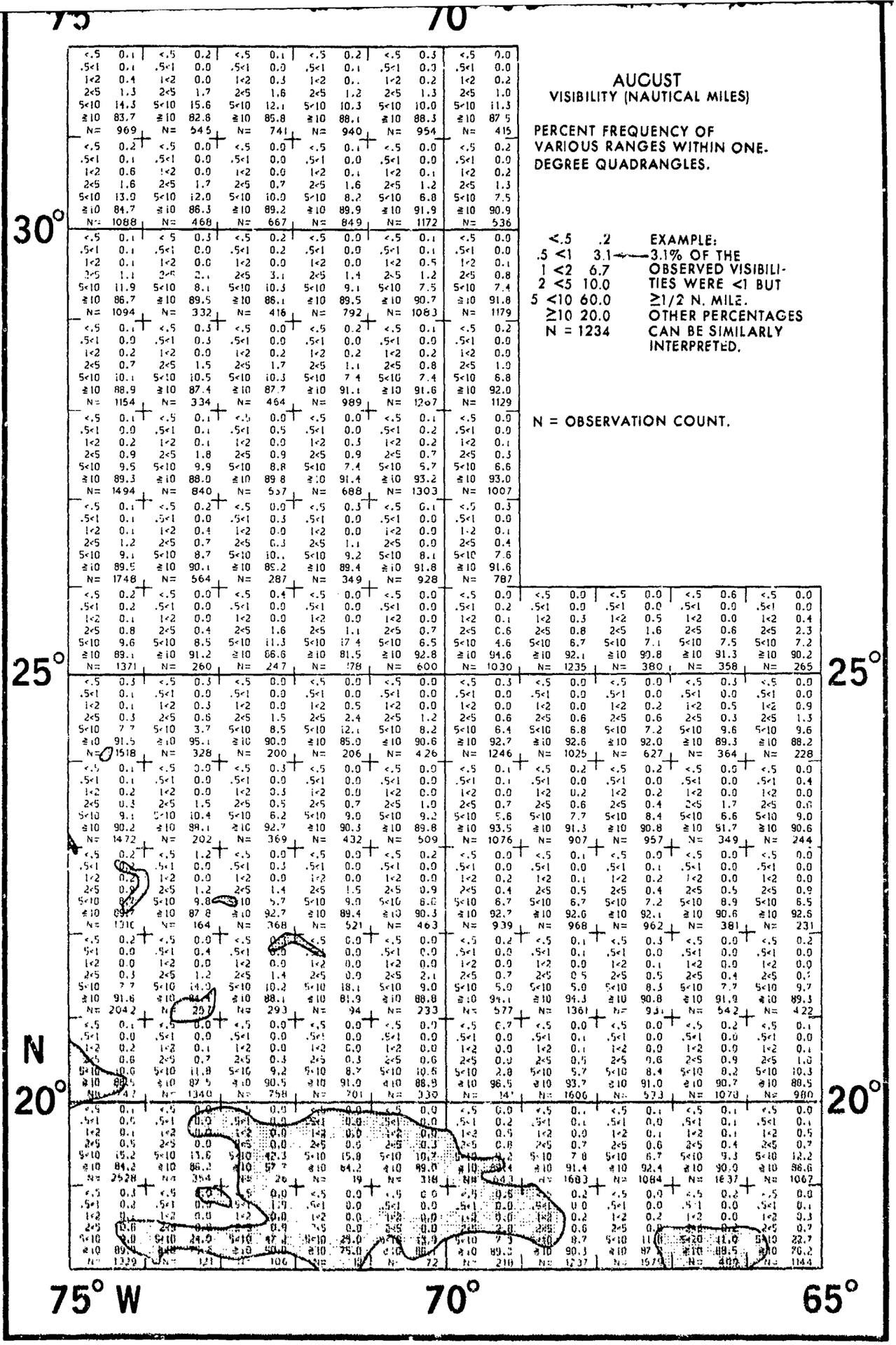
AUGUST
VISIBILITY (NAUTICAL MILES)

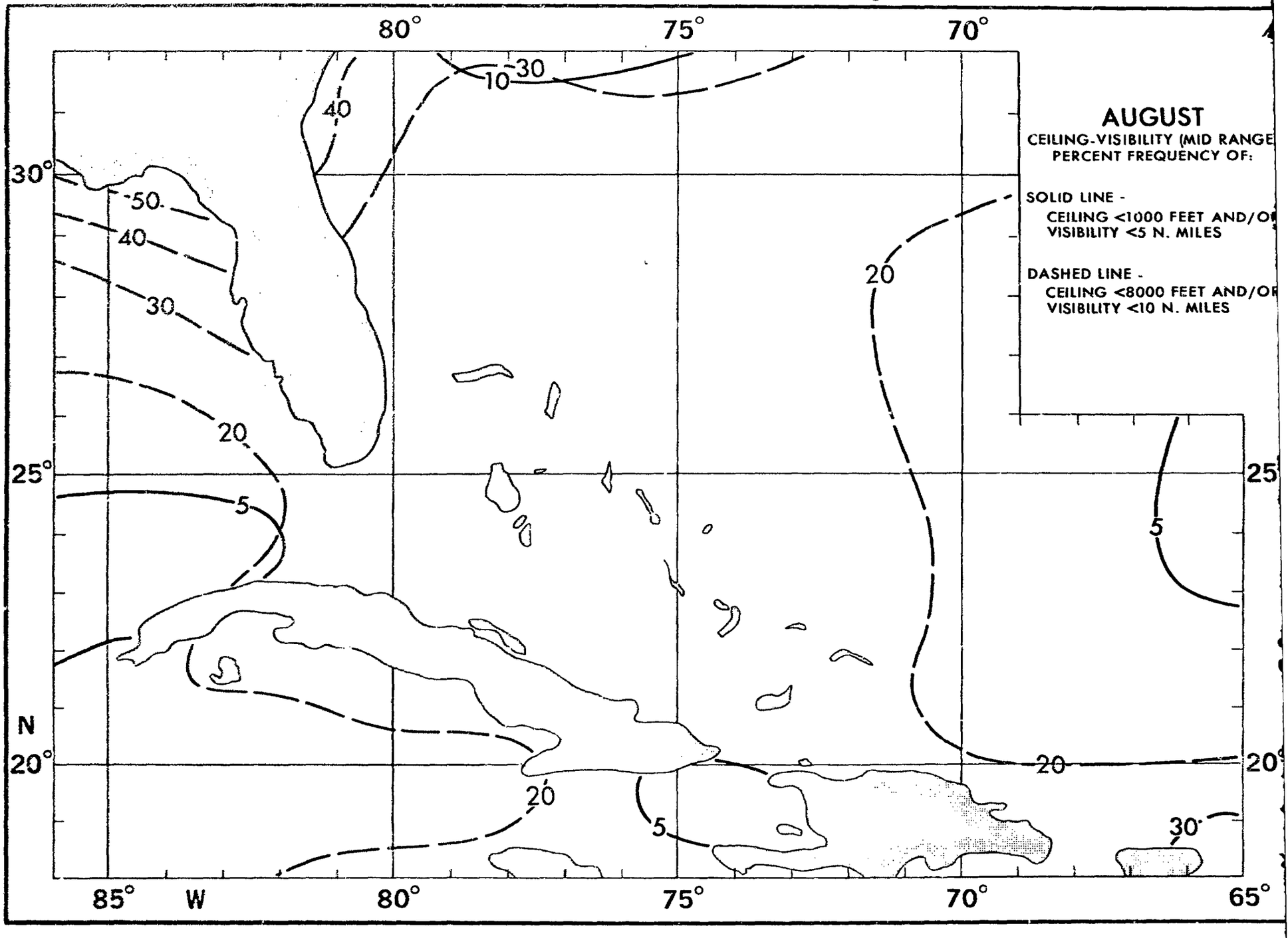
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

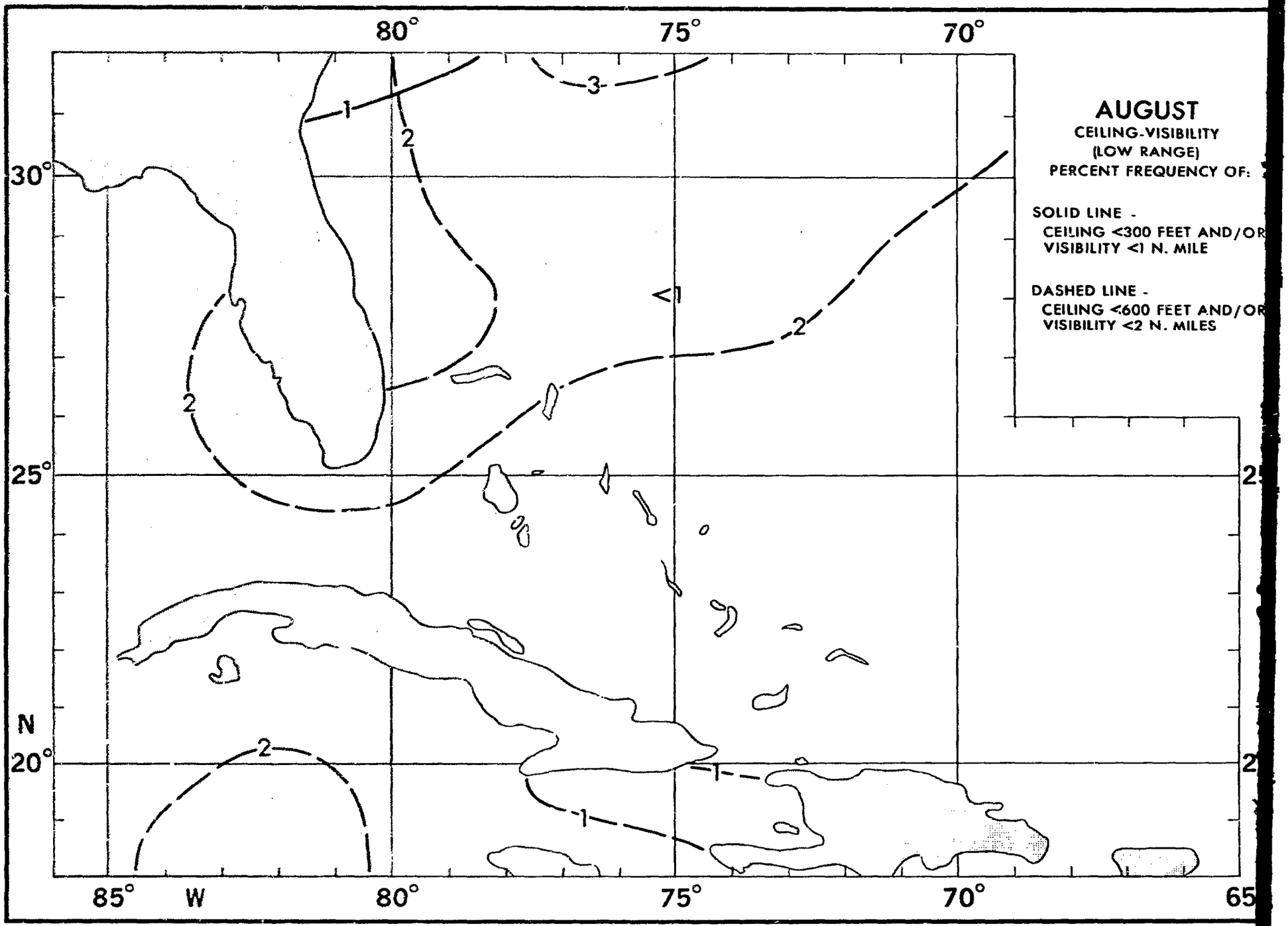
<.5	.2
.5 <1	3.1
1 <2	6.7
2 <5	10.0
5 <10	60.0
≥10	20.0
N =	1234

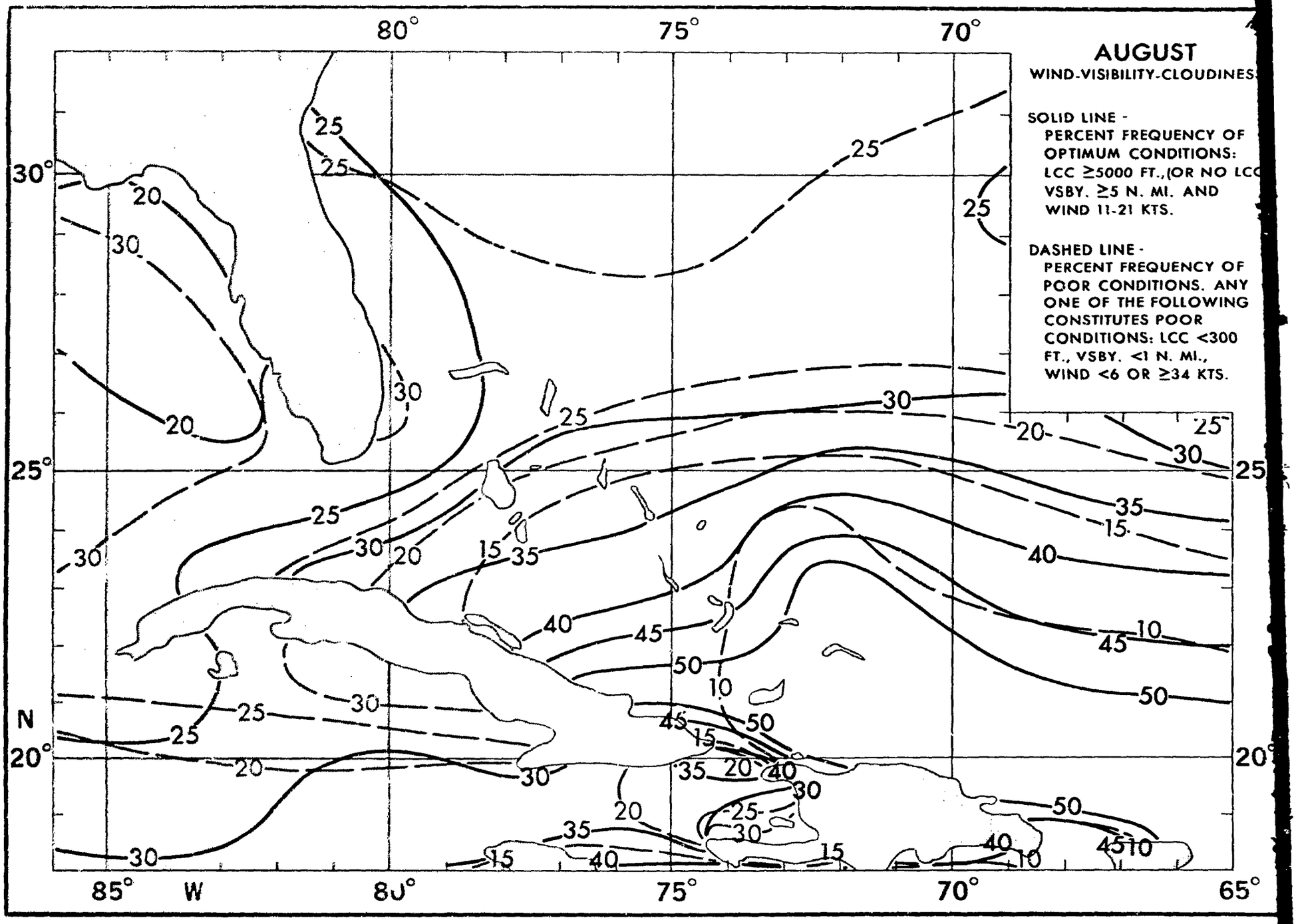
EXAMPLE: 3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE. OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.

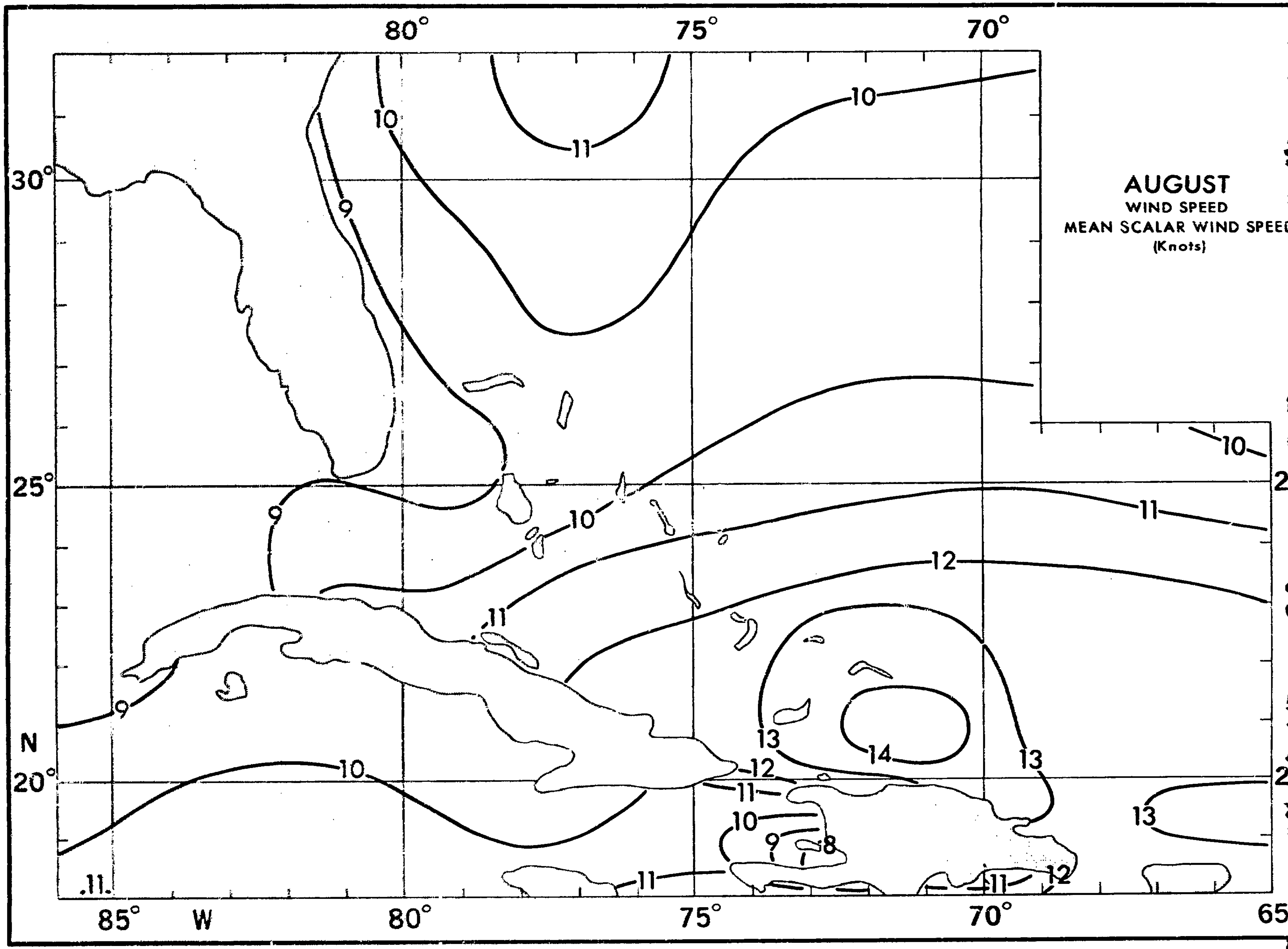
N = OBSERVATION COUNT.



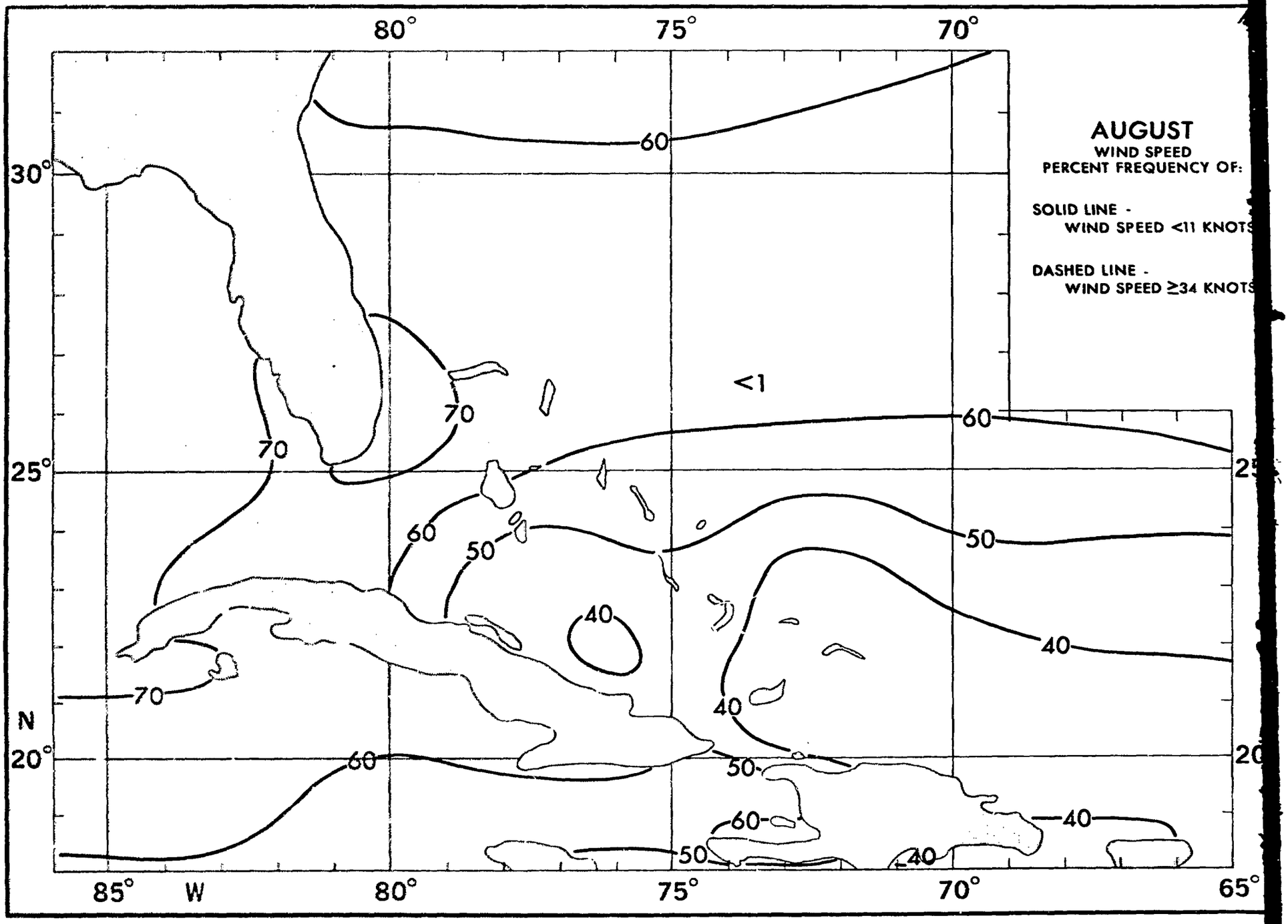

AUGUST
CEILING-VISIBILITY (MID RANGE
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
10
30
40
50
40
30
20
5
20
5
20
20
5
30

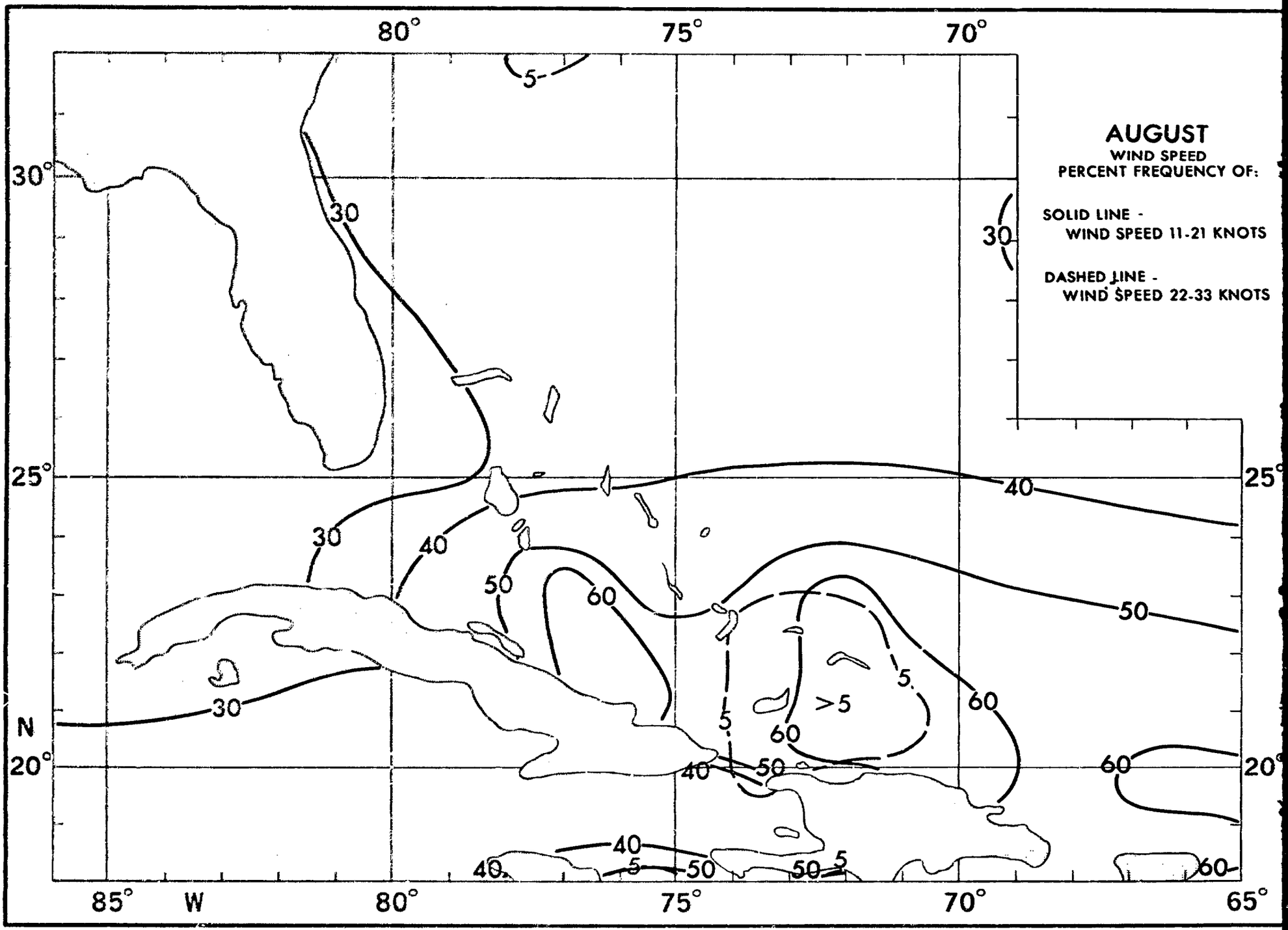

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65
AUGUST
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE -
CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES
1
2
3
<1
2
2
2
1
1

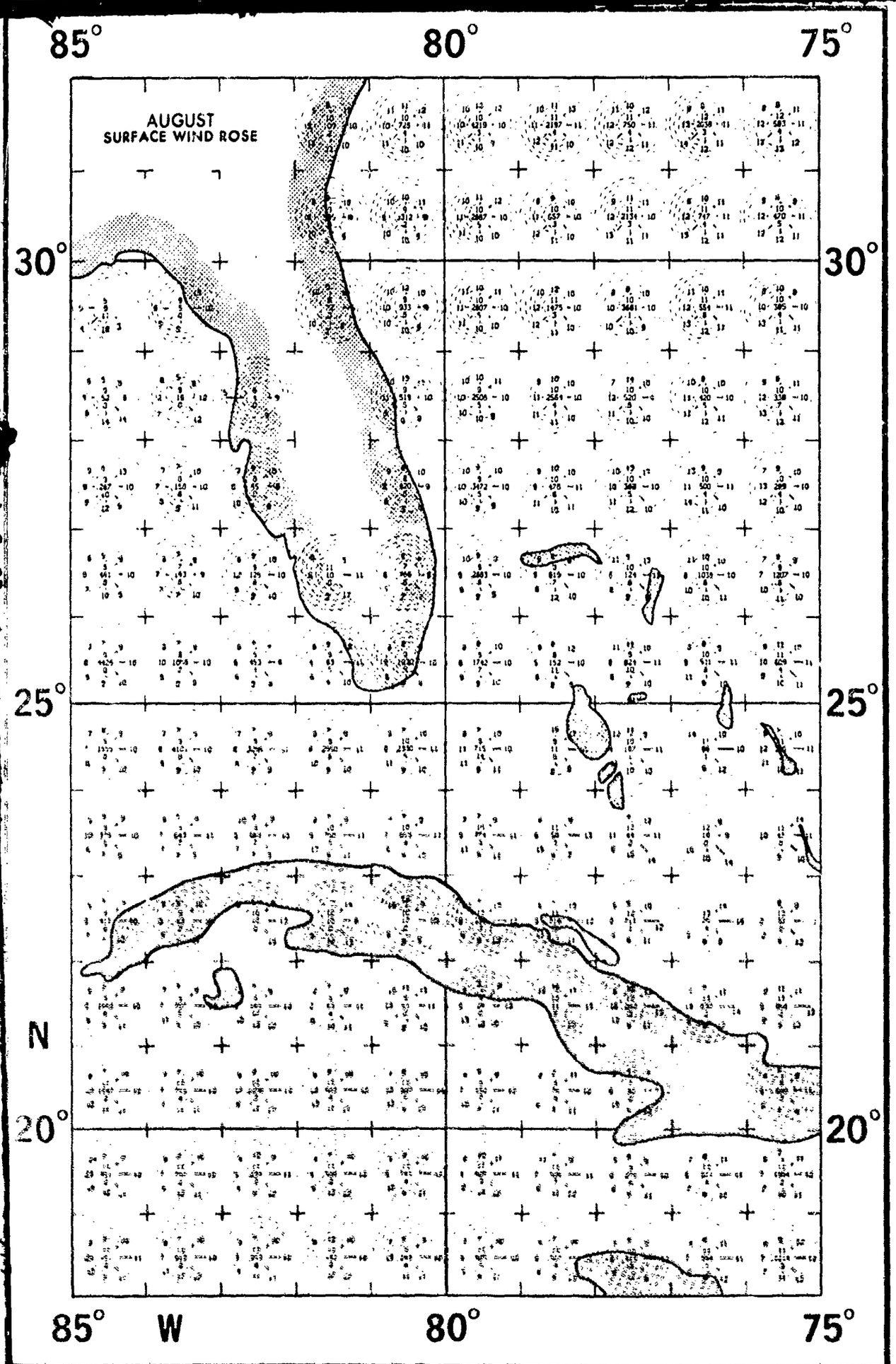

AUGUST
WIND-VISIBILITY-CLOUDINES
SOLID LINE -
PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE -
PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
80°
75°
70°
30°
25°
N
20°
85° W
80°
75°
70°
65°

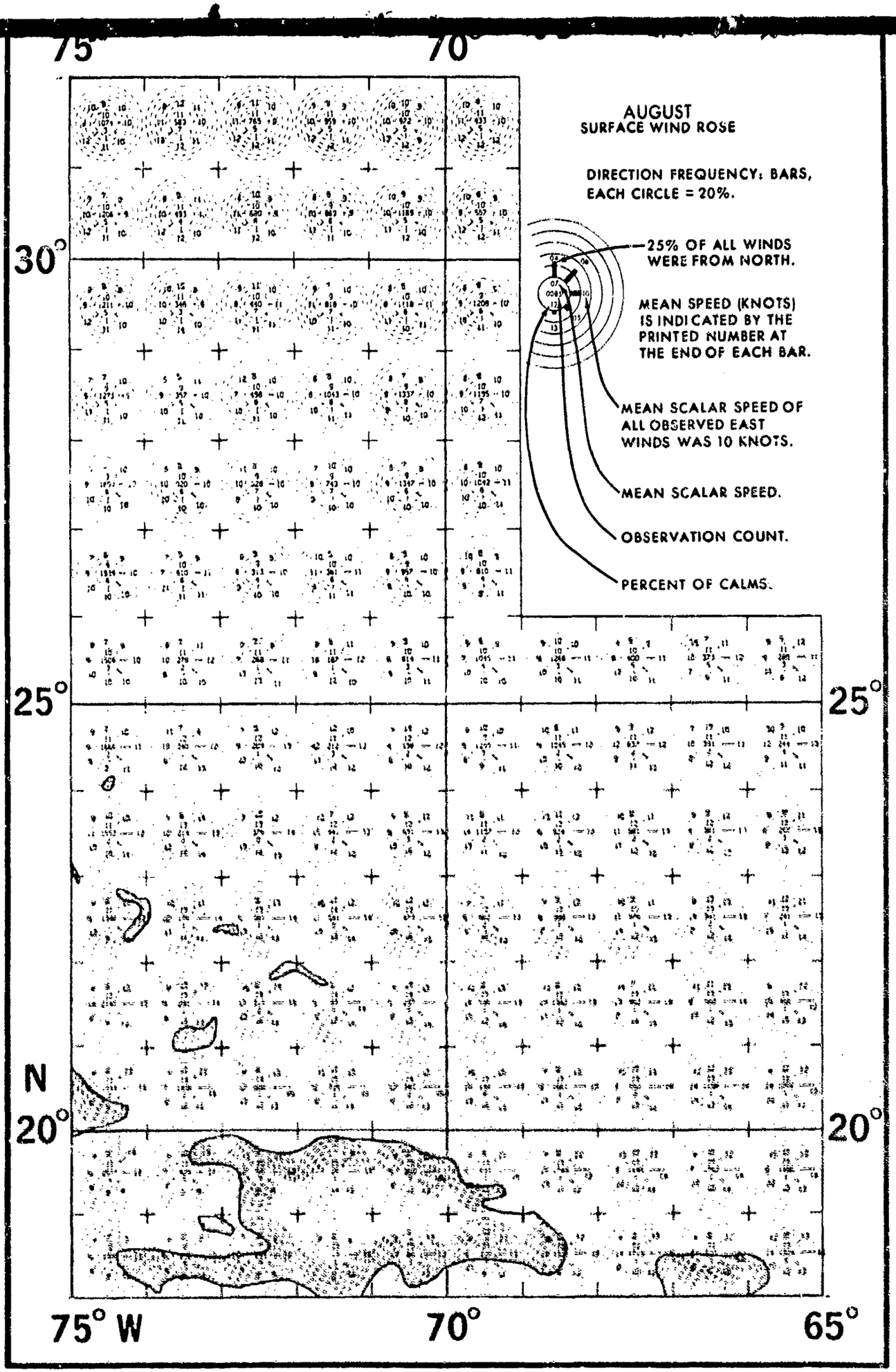


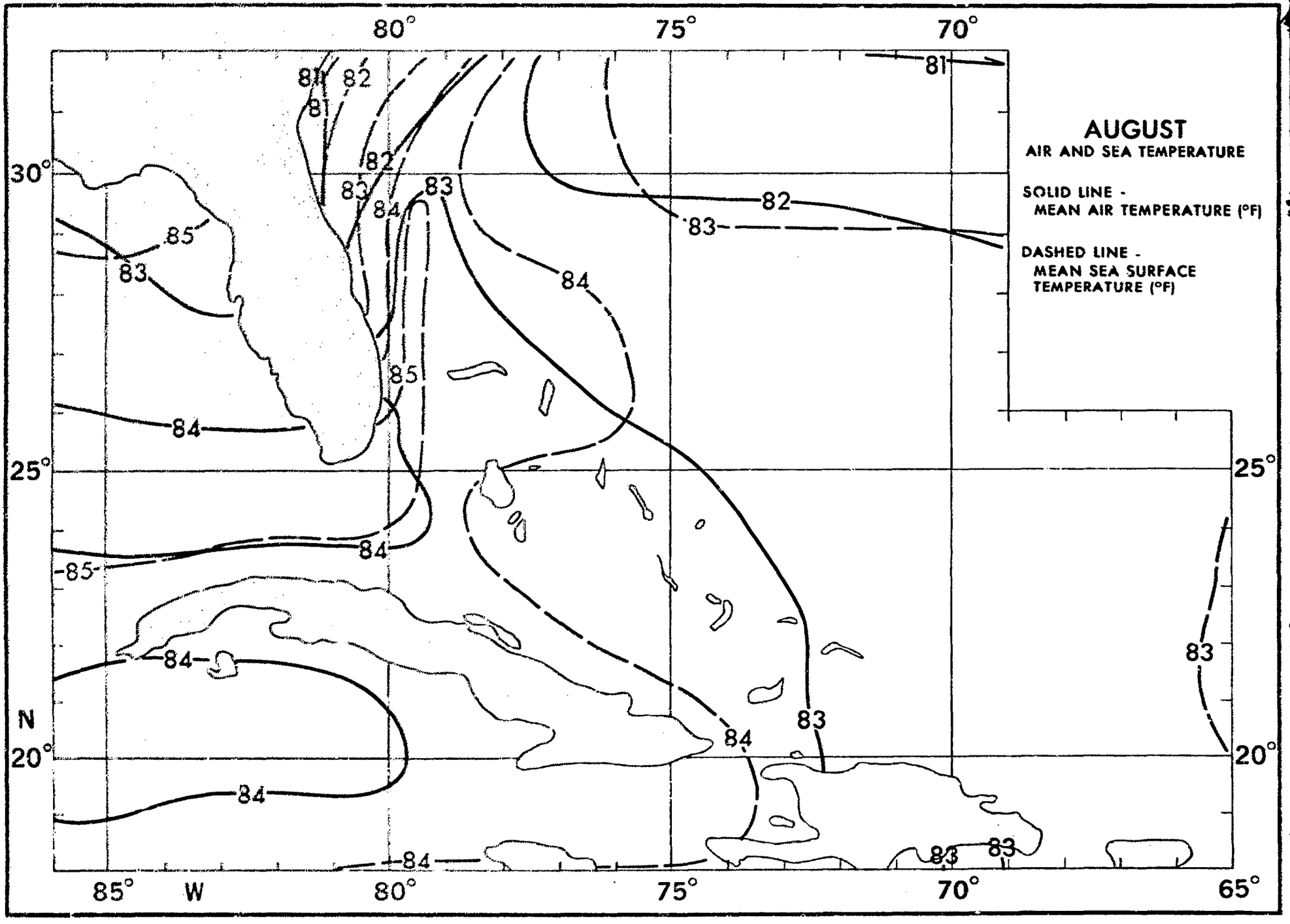
AUGUST
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)
80°
75°
70°
65°
85°
W
30°
25°
20°
N
10
11
12
13
14
9
8

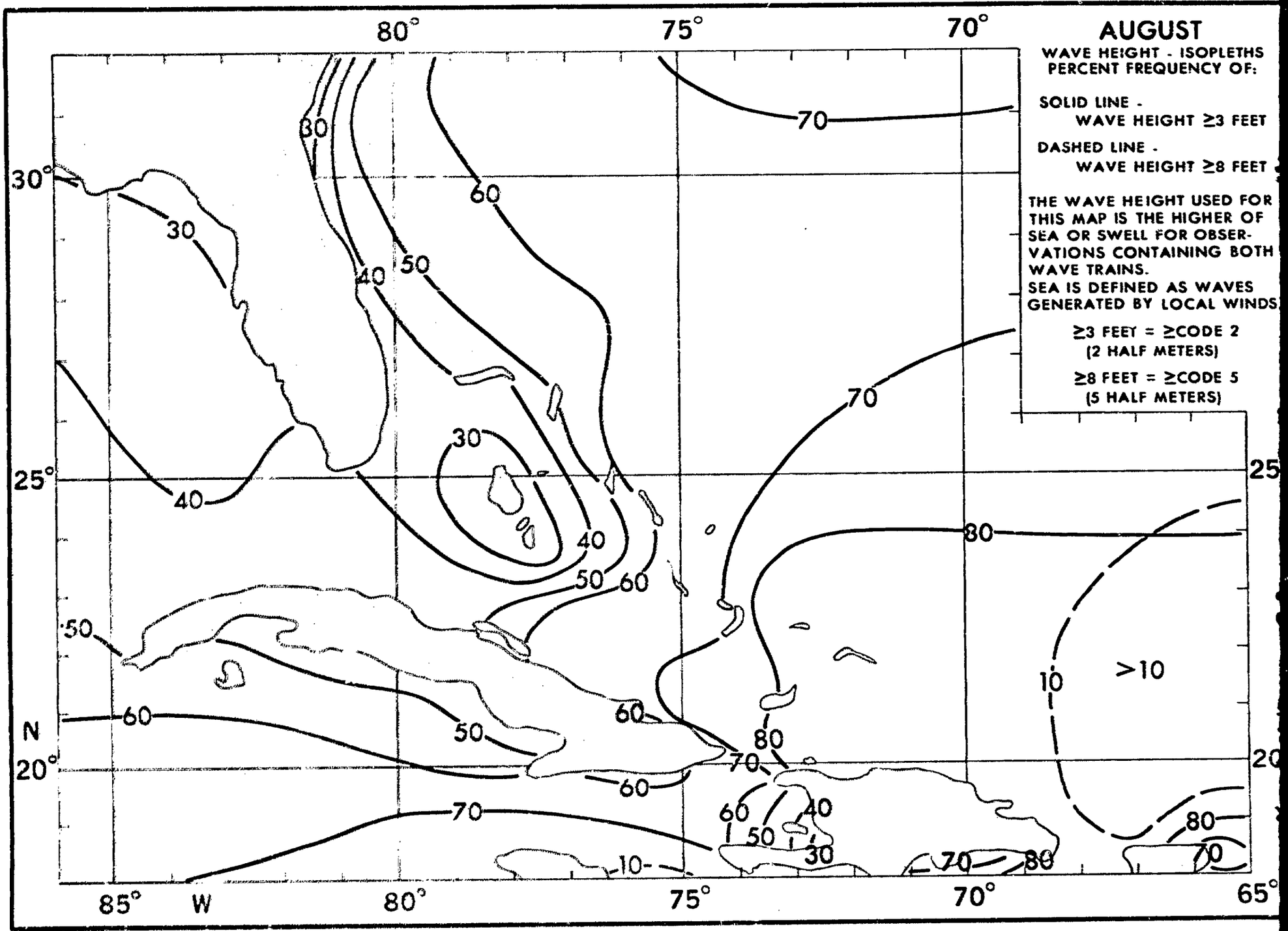

AUGUST
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
<1
70
70
60
60
50
50
40
40
40
70
60
60
50
50
40
40

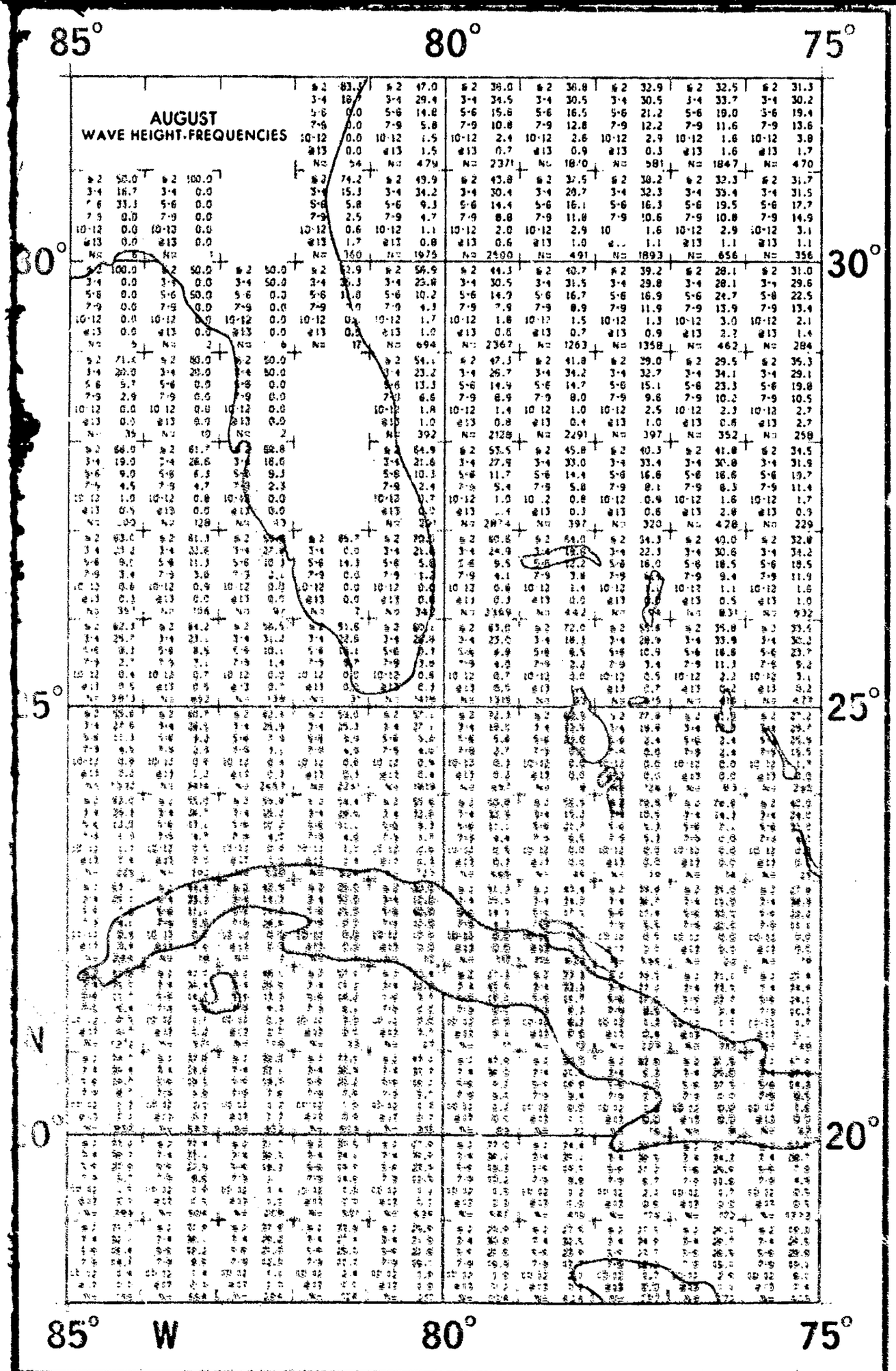

AUGUST
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED 11-21 KNOTS
DASHED LINE -
WIND SPEED 22-33 KNOTS
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
5
30
40
50
60
>5


AUGUST
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
W


75°
70°
30°
25°
20°
N
75° W
70°
65°
AUGUST
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


AUGUST
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
81
82
83
84
85


AUGUST
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEET
DASHED LINE -
WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS.
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
80°
75°
70°
30°
25°
20°
N
85°
W
65°
>10


AUGUST
WAVE HEIGHT-FREQUENCIES
85°
80°
75°
30°
25°
20°
85° W
80°
75°

AUGUST
WAVE HEIGHT-FREQUENCIES

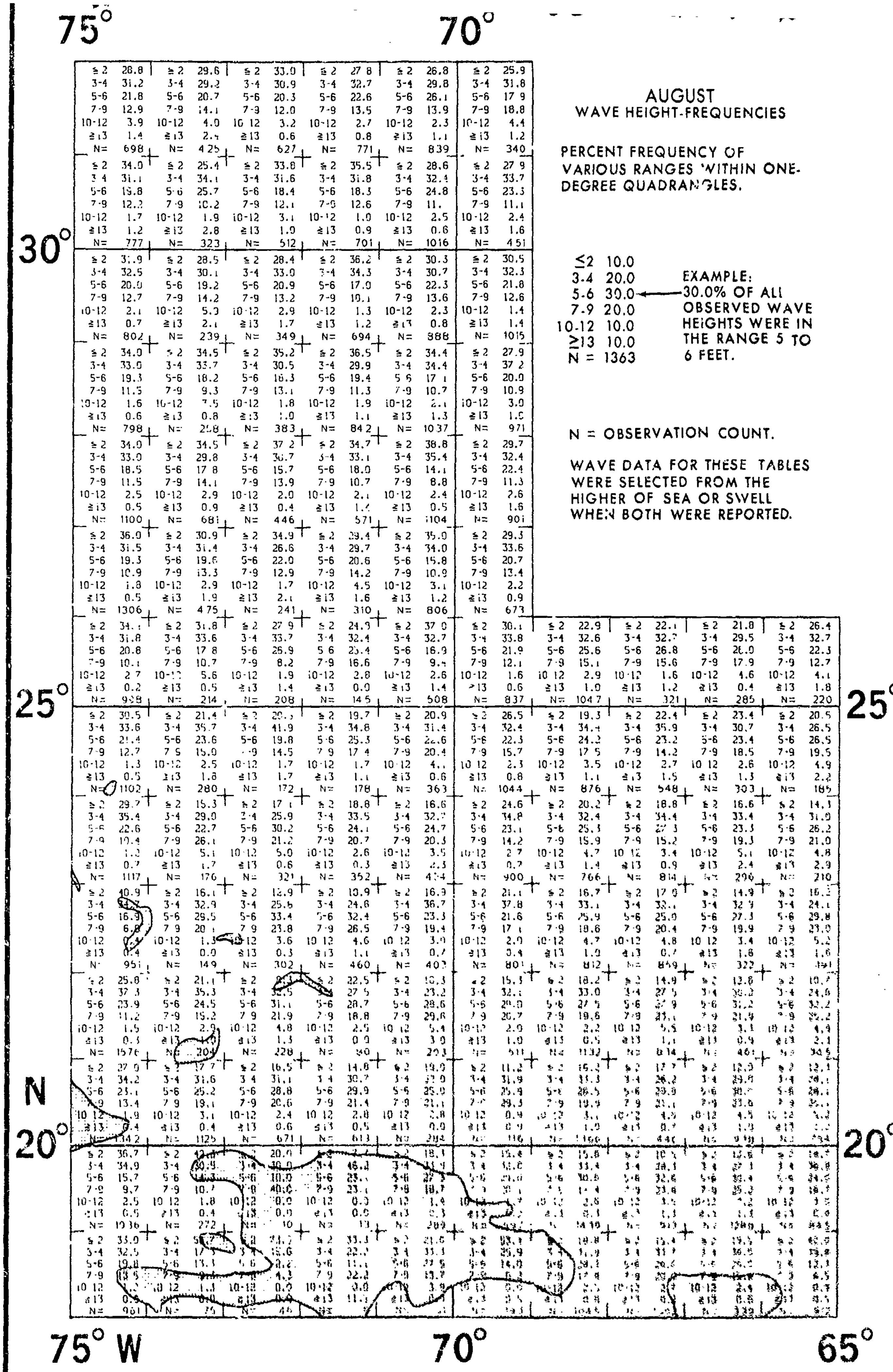
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

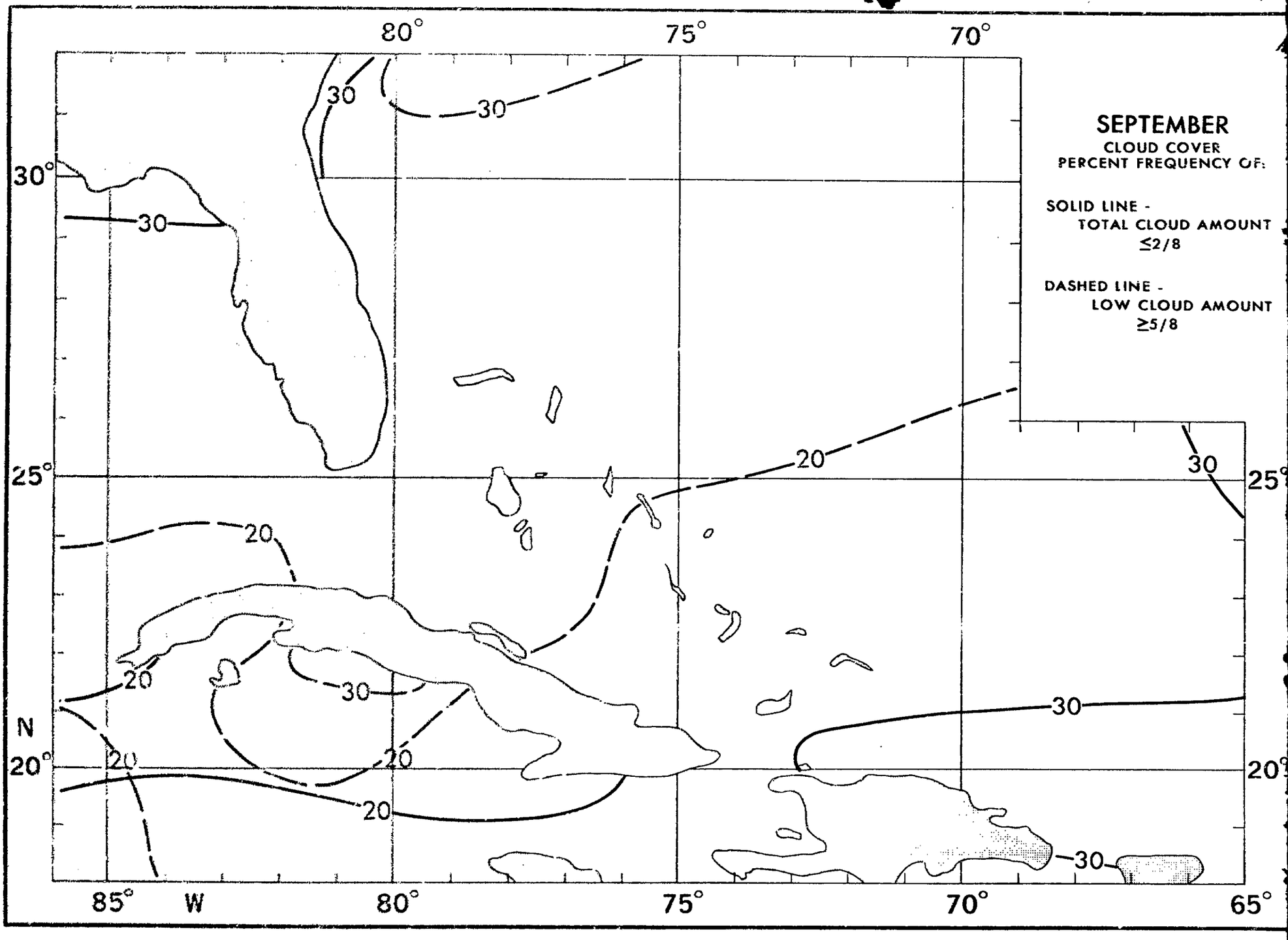
≤2	10.0
3-4	20.0
5-6	30.0
7-9	20.0
10-12	10.0
≥13	10.0
N =	1363

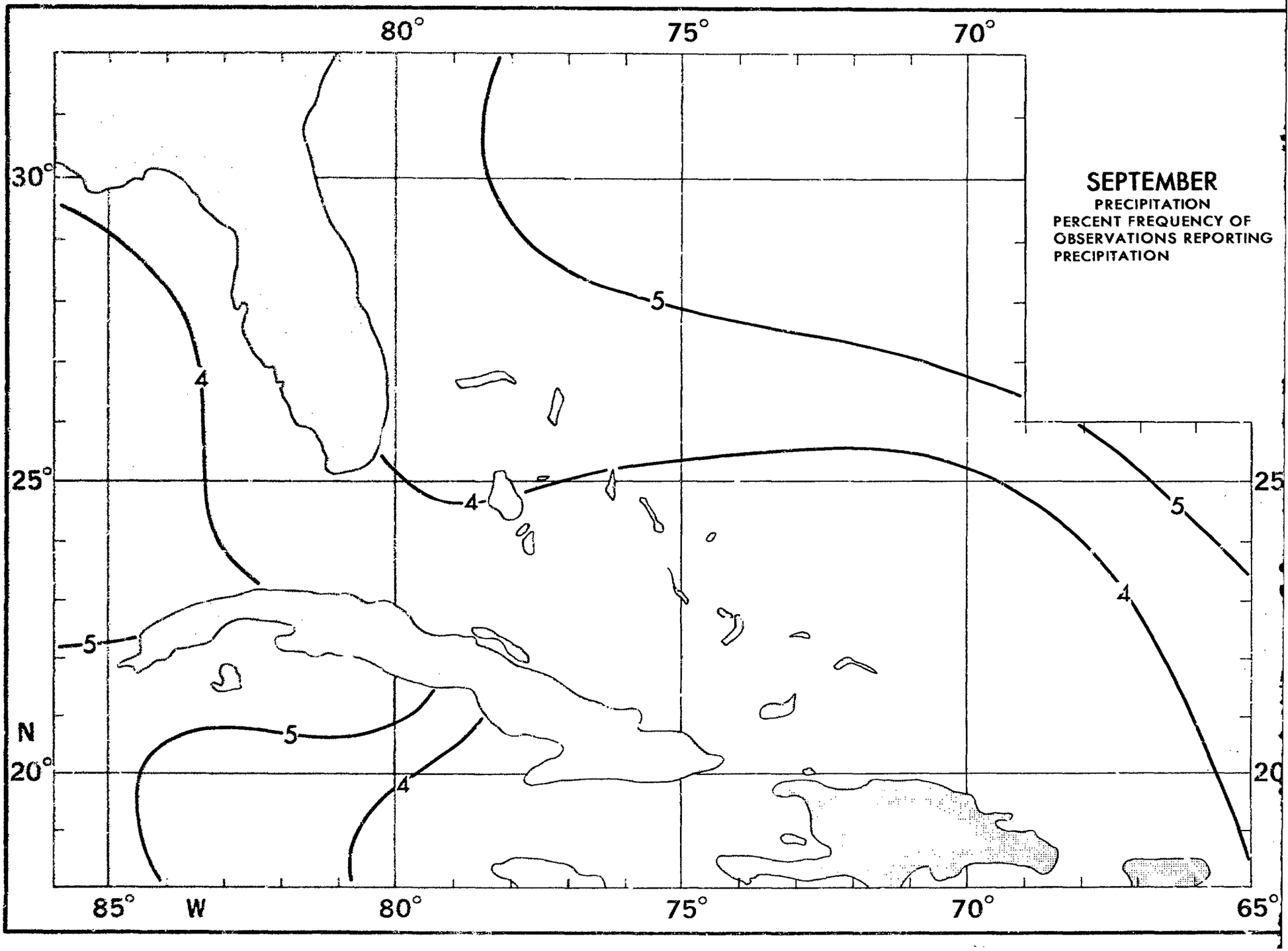
EXAMPLE: 30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.

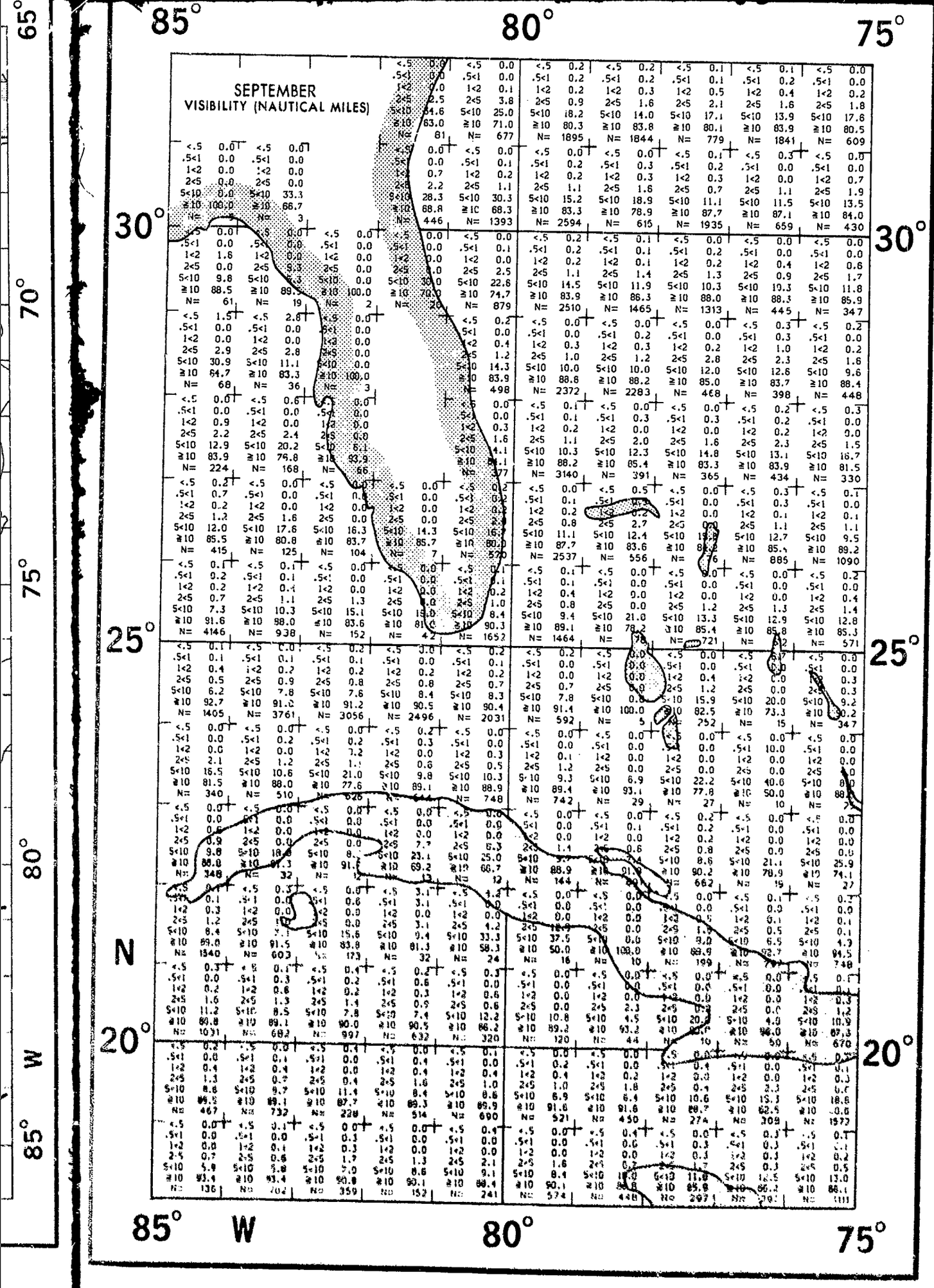
N = OBSERVATION COUNT.

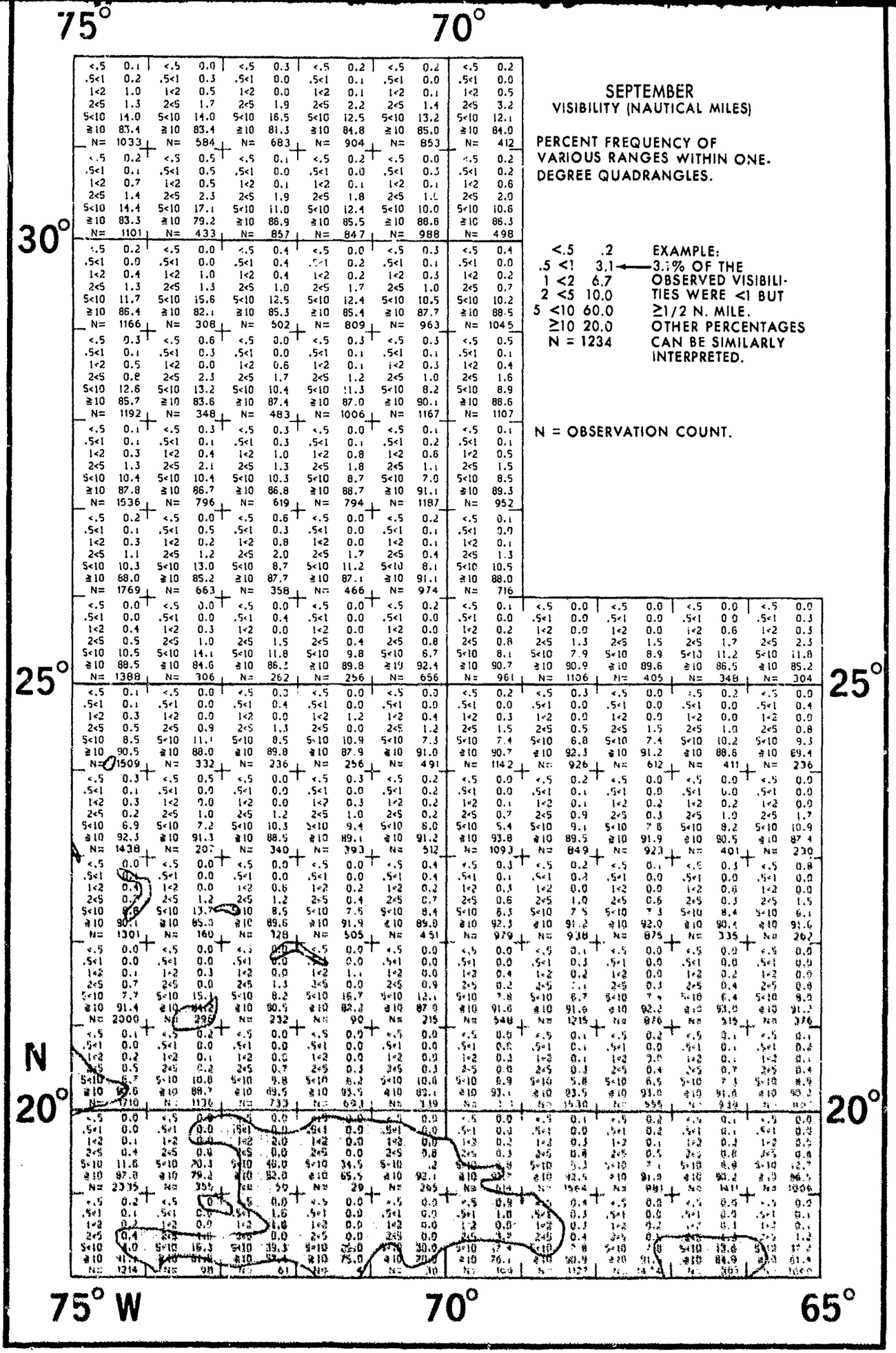
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.




80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
30
30
30
20
20
20
20
20
30
30
30
SEPTEMBER
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/8


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
SEPTEMBER
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION
5
4
4
5
4
5
5
4


SEPTEMBER
VISIBILITY (NAUTICAL MILES)
85°
80°
75°
30°
25°
20°
N
W



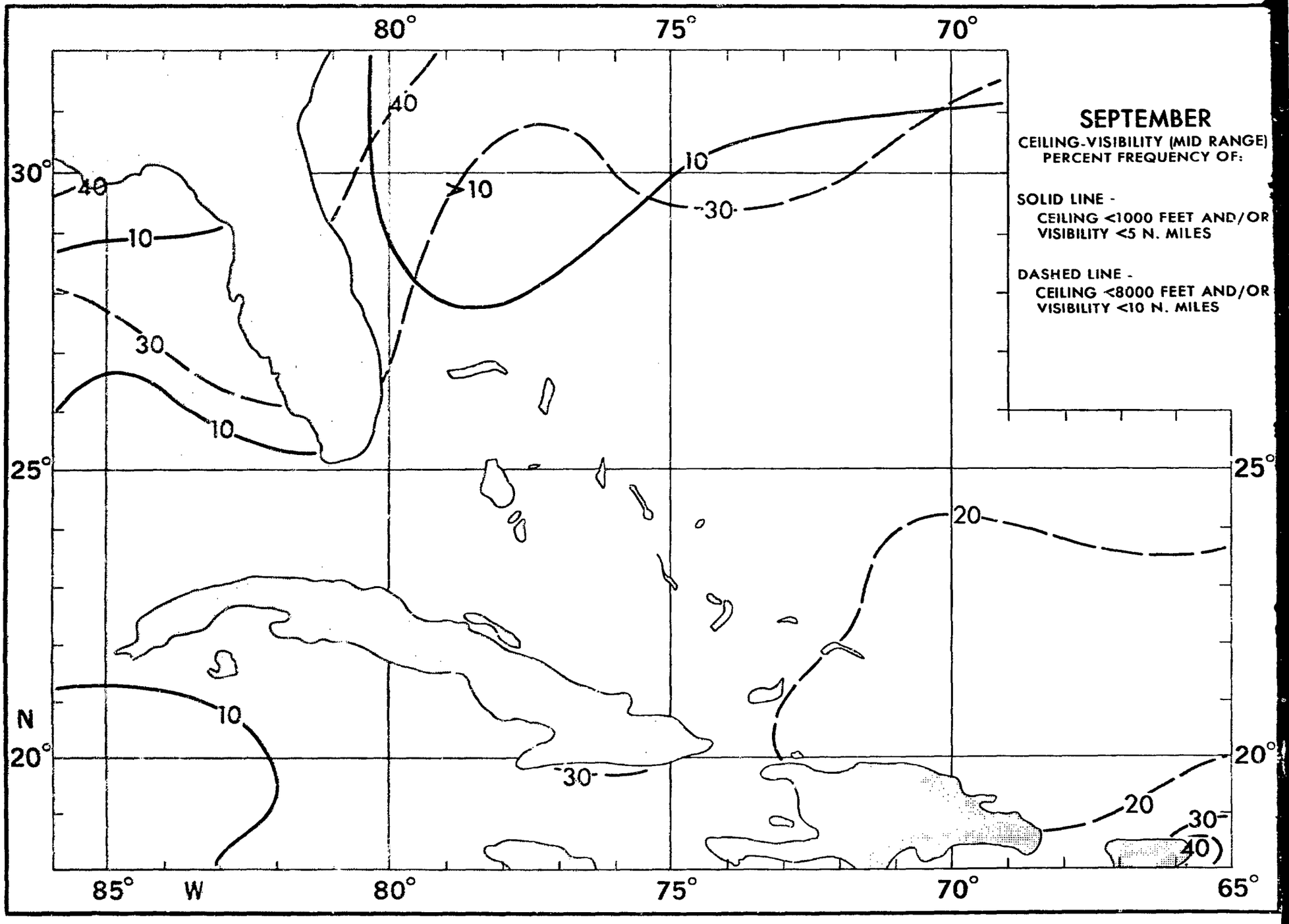
SEPTEMBER
VISIBILITY (NAUTICAL MILES)

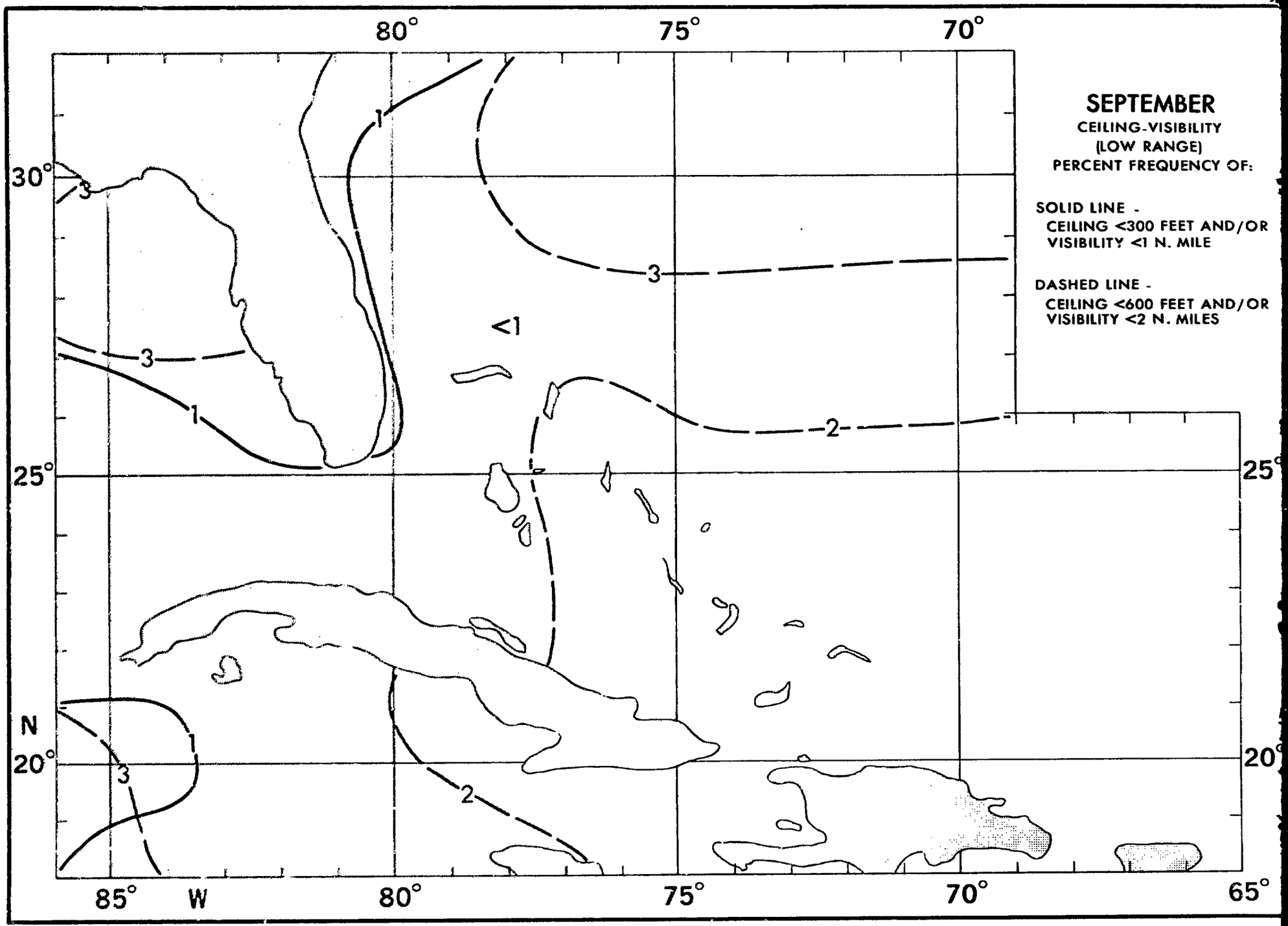
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

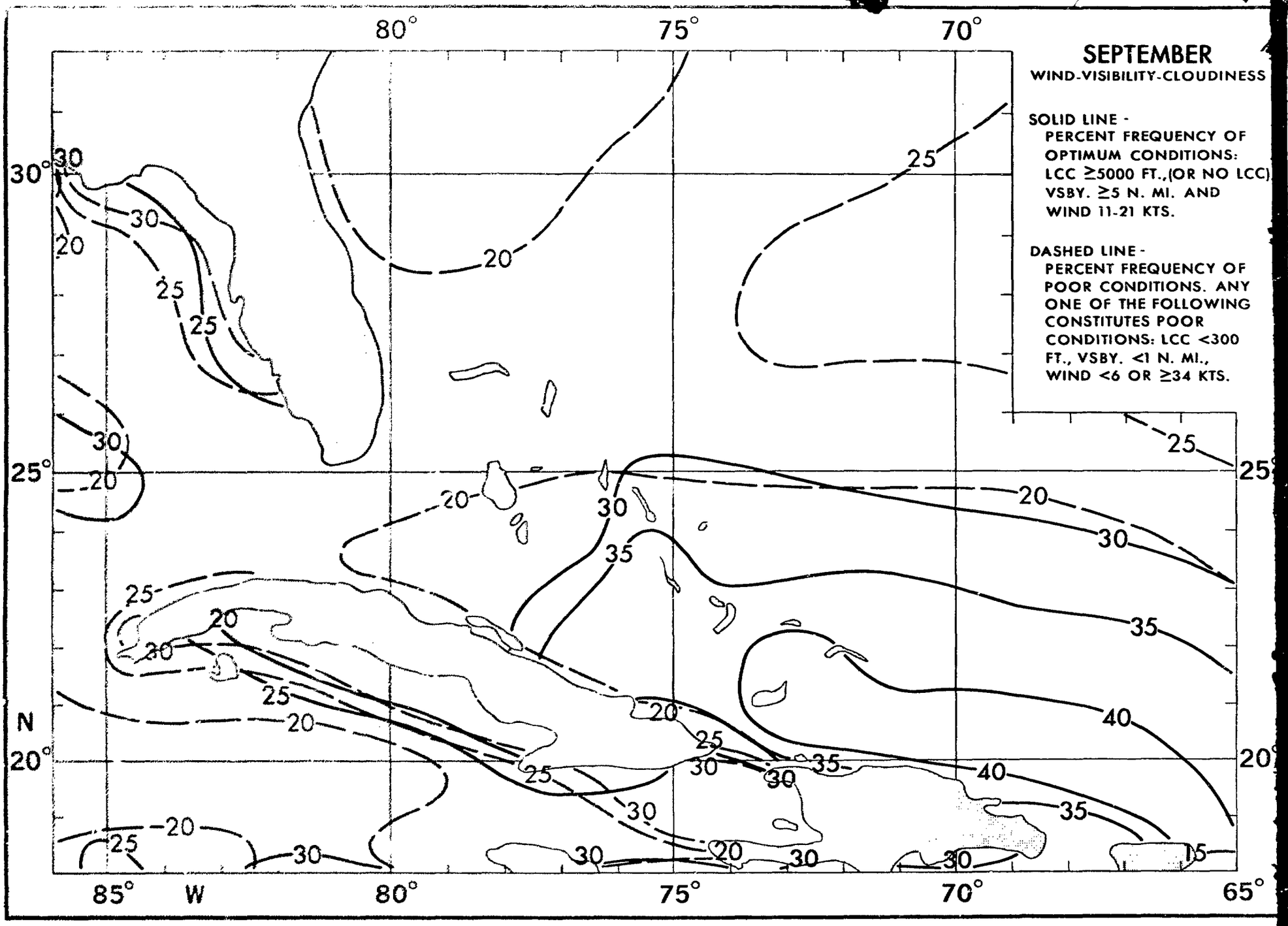
<.5	.2
.5 <1	3.1
1 <2	6.7
2 <5	10.0
5 <10	60.0
≥10	20.0
N =	1234

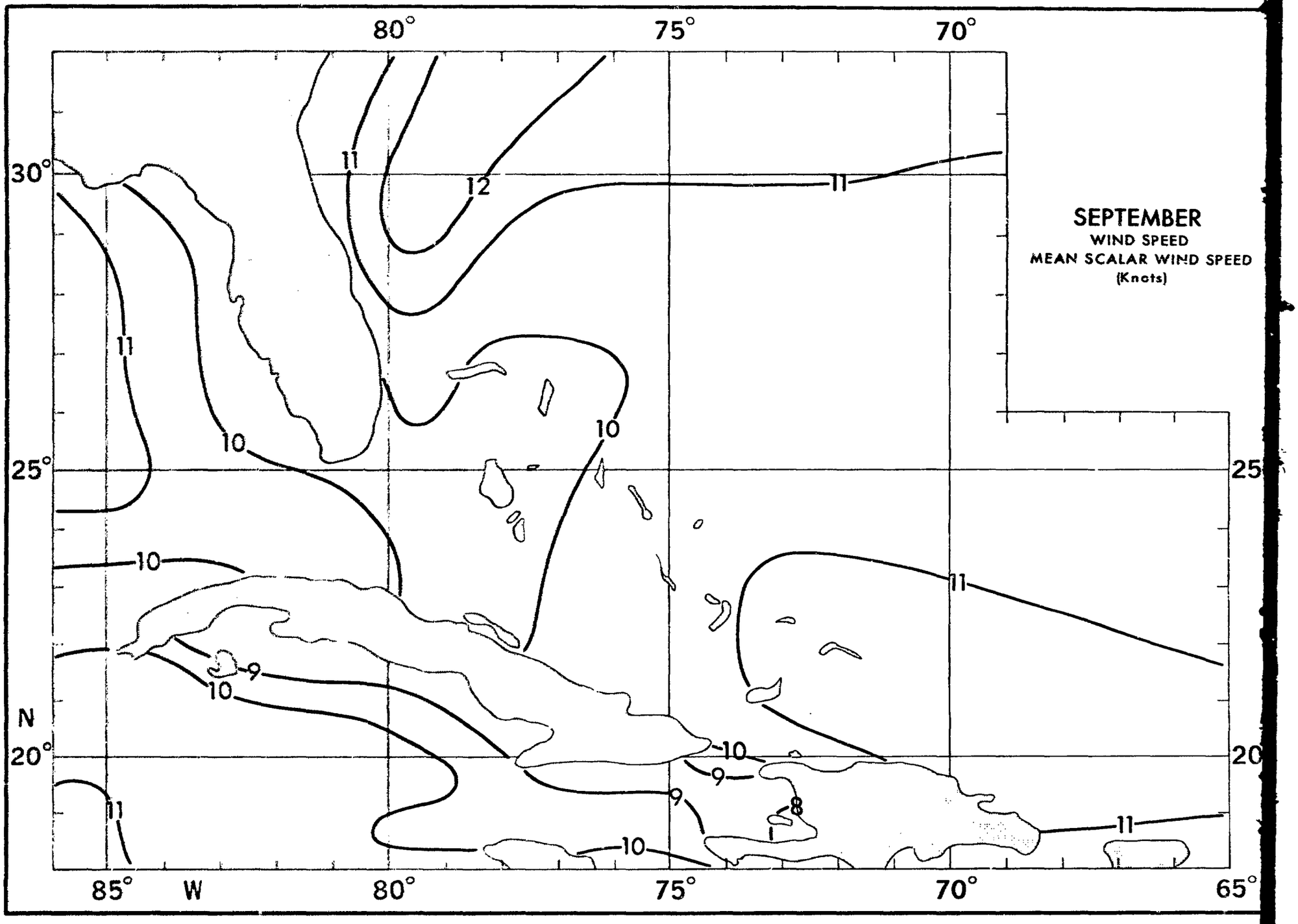
EXAMPLE: 3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE. OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.

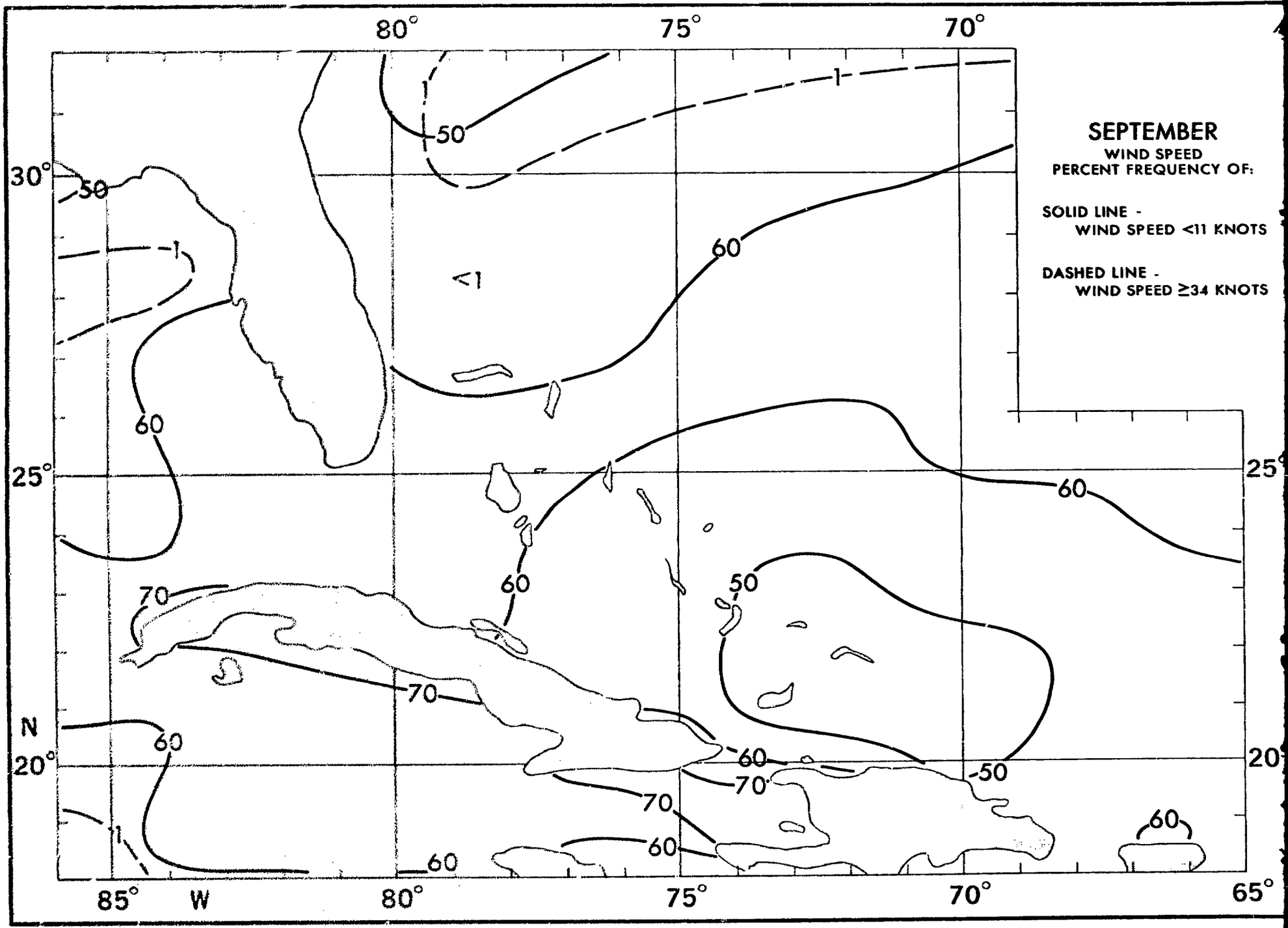
N = OBSERVATION COUNT.

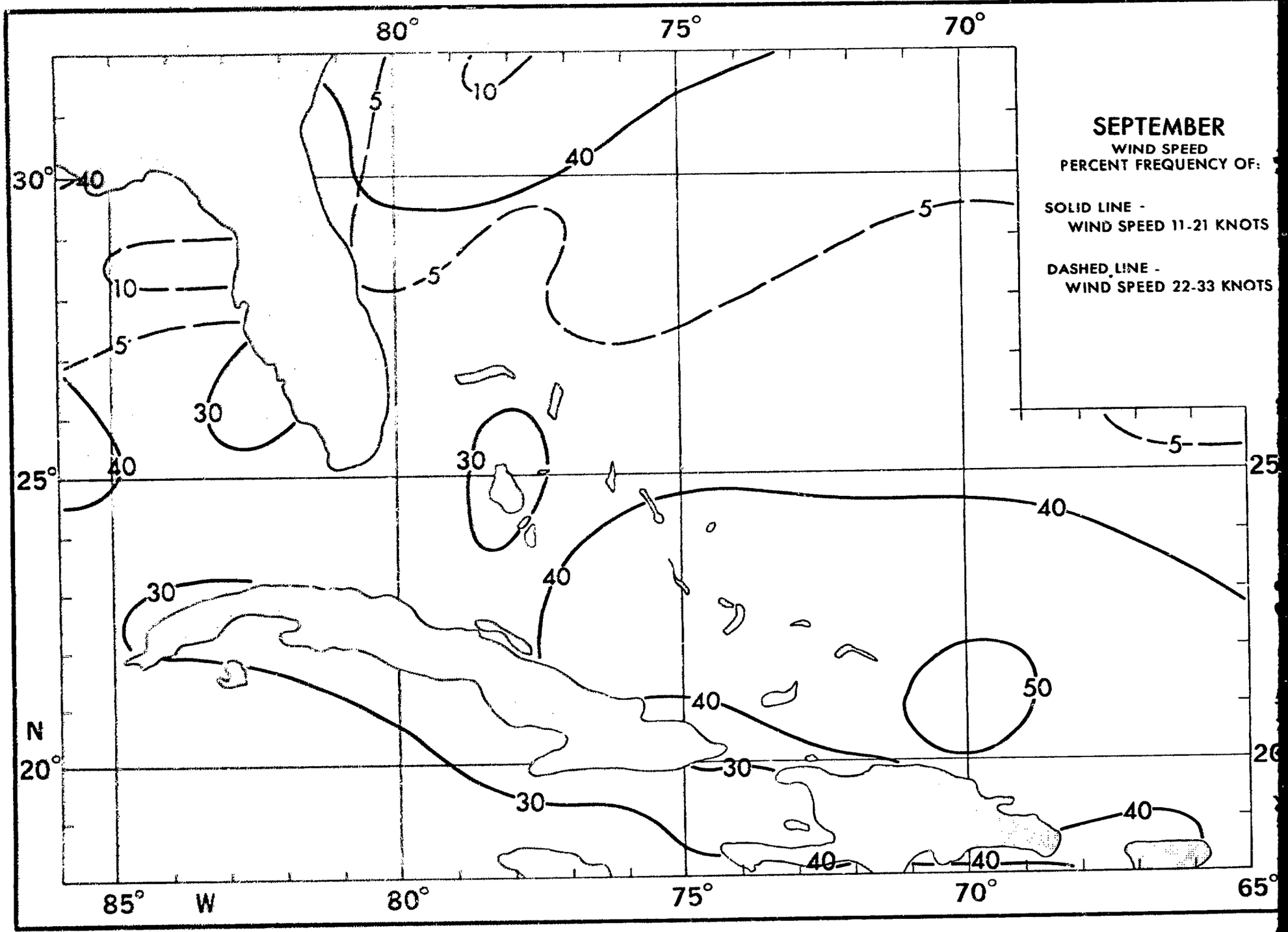

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
40
10
30
10
10
30
10
20
30
20
30
40)
SEPTEMBER
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES

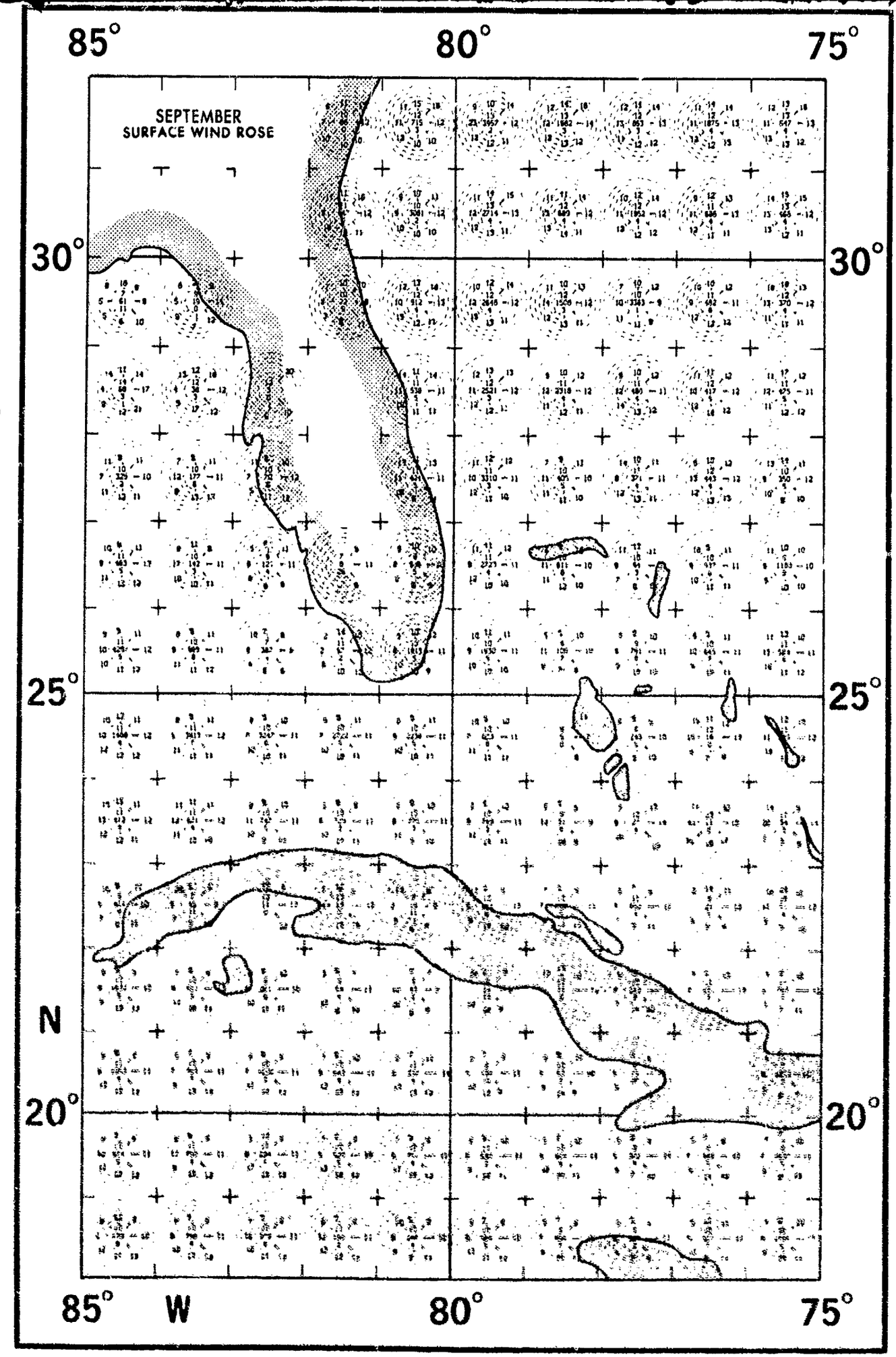

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
SEPTEMBER
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE -
CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES
<1
1
2
3

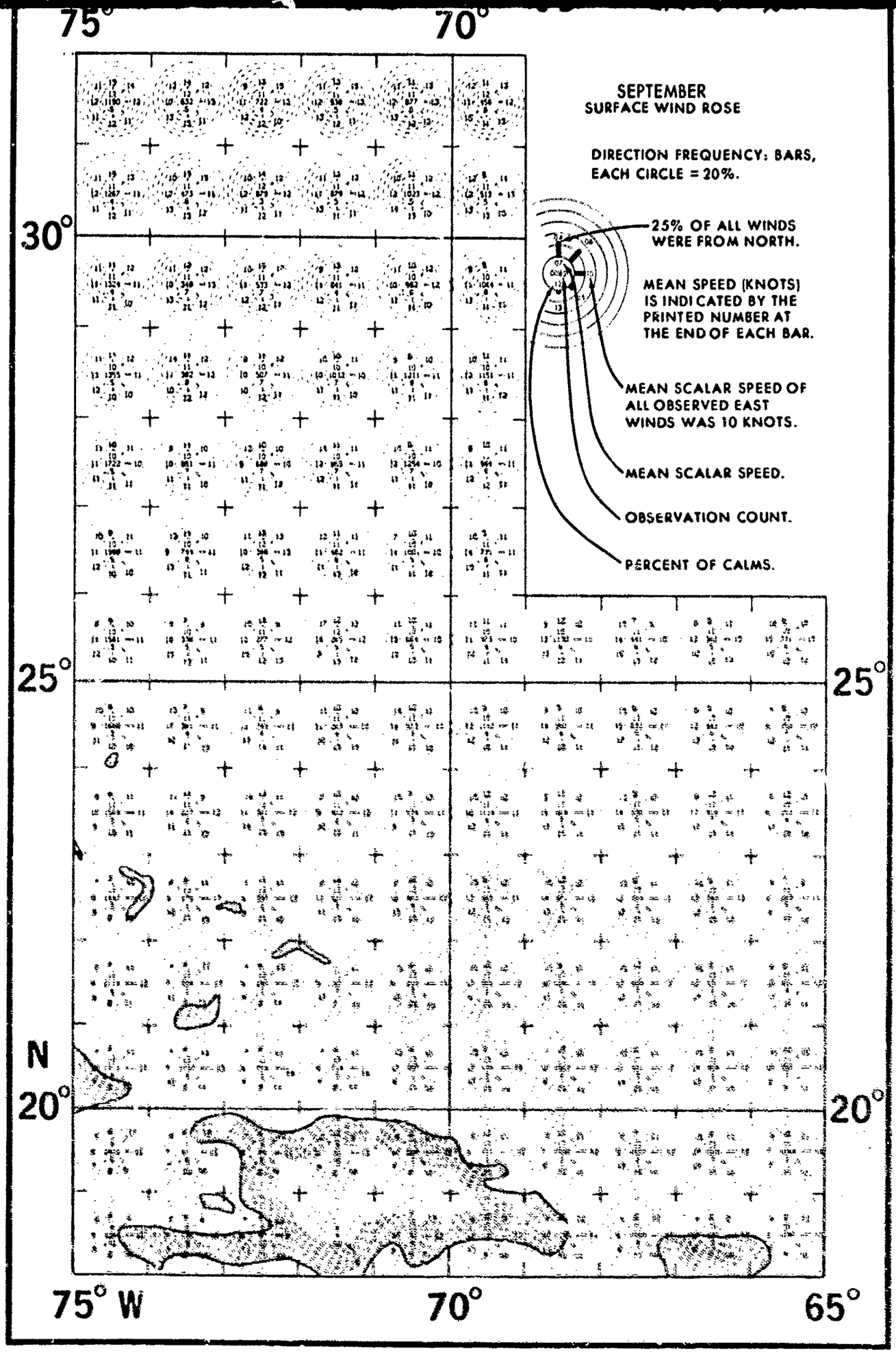

SEPTEMBER
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC) VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°

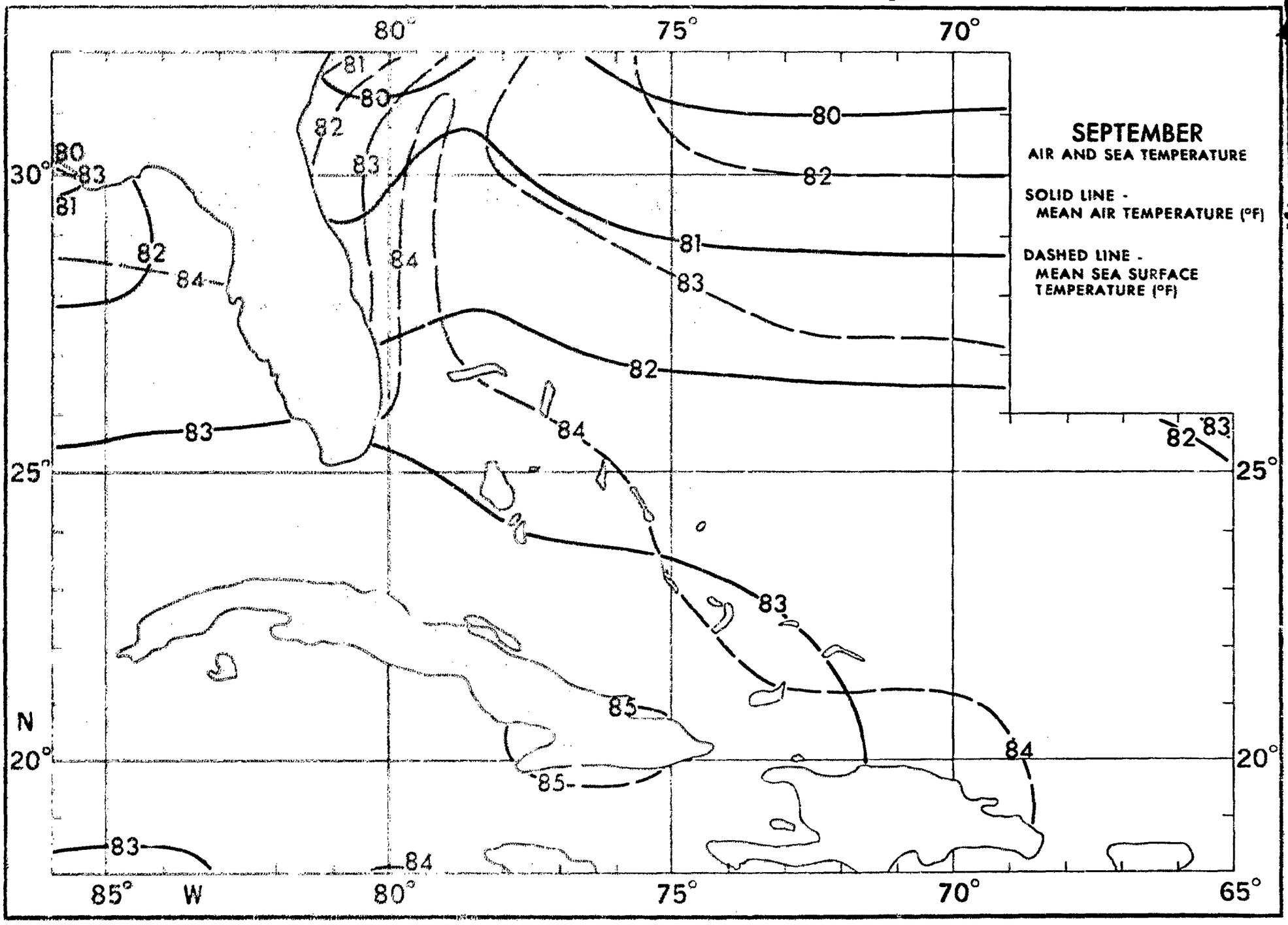

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
SEPTEMBER
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)
11
12
11
11
10
10
10
9
10
11
10
9
9
8
11
10

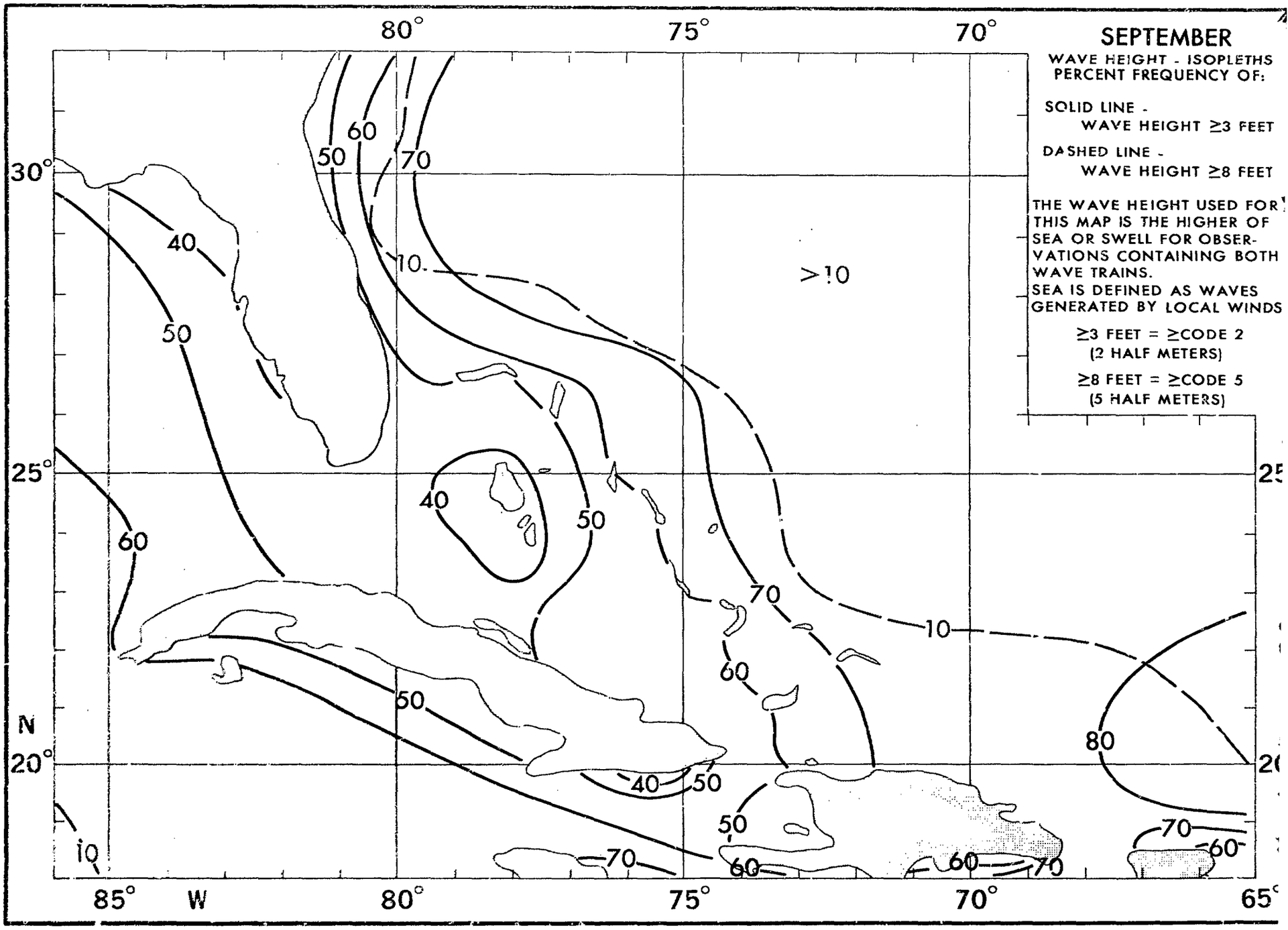

SEPTEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS
80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°
<1
1
50
60
70

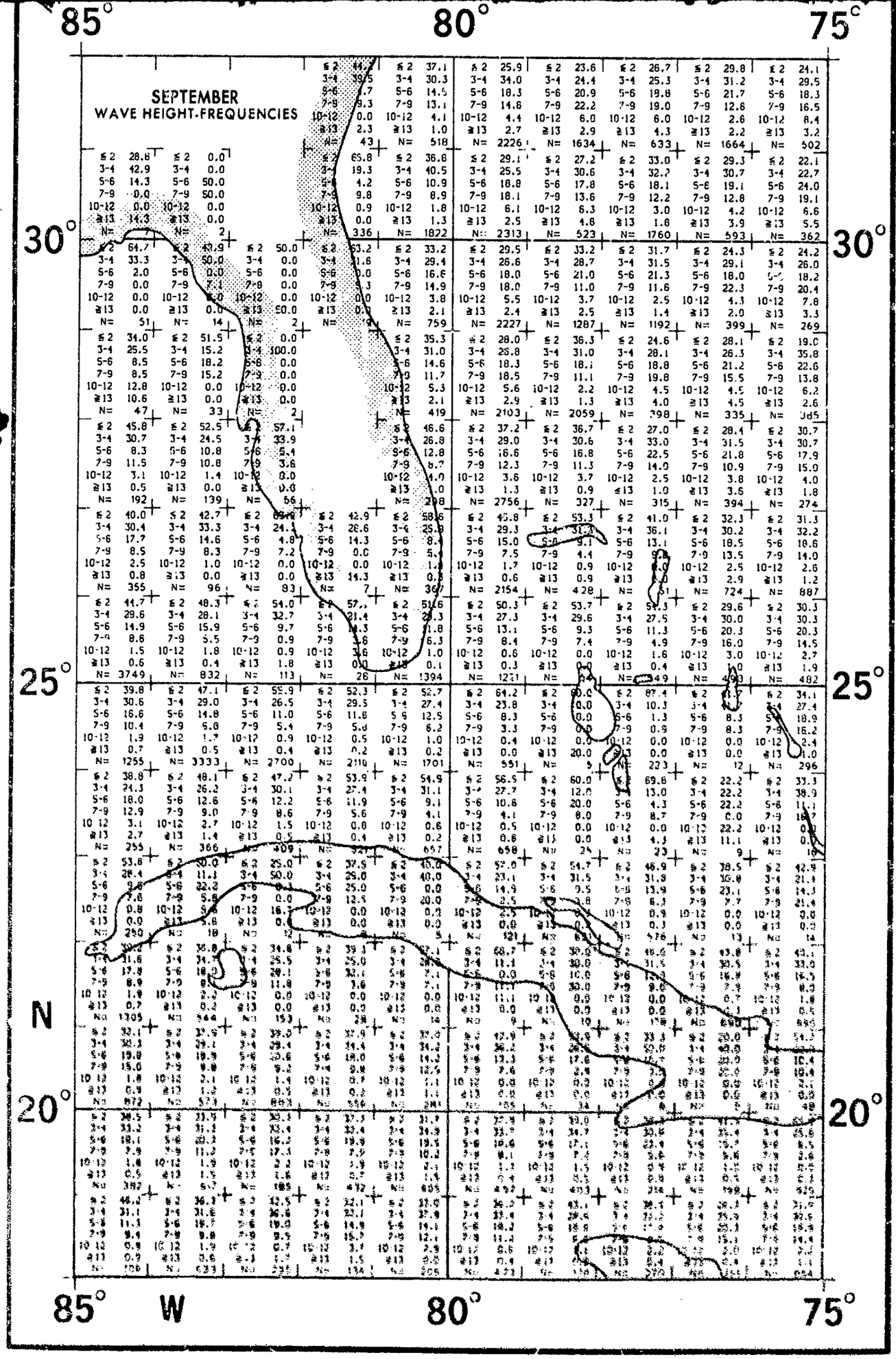

SEPTEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED 11-21 KNOTS
DASHED LINE -
WIND SPEED 22-33 KNOTS
80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°
5
10
40
30
50

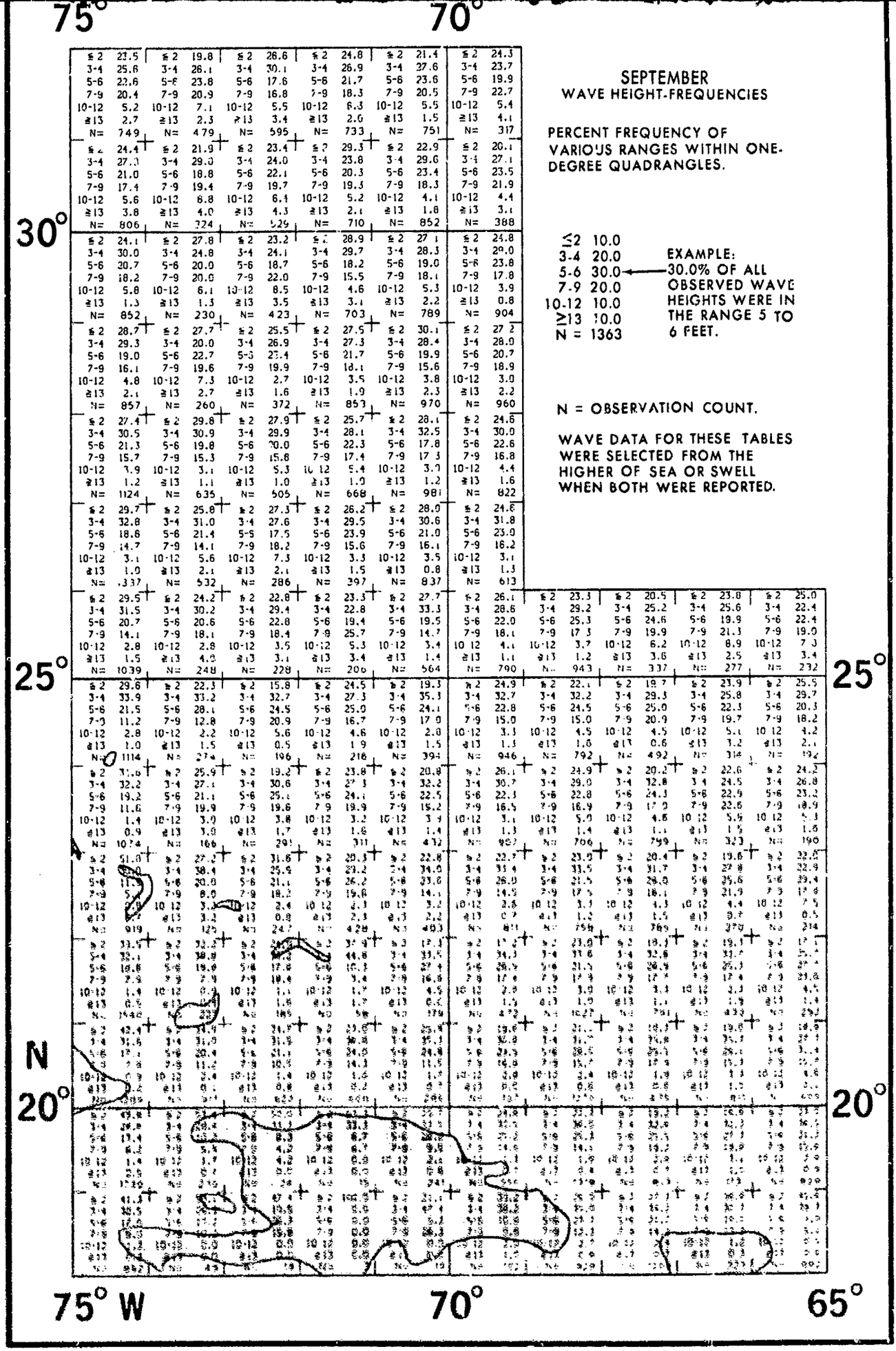

SEPTEMBER
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
85° W
80°
75°

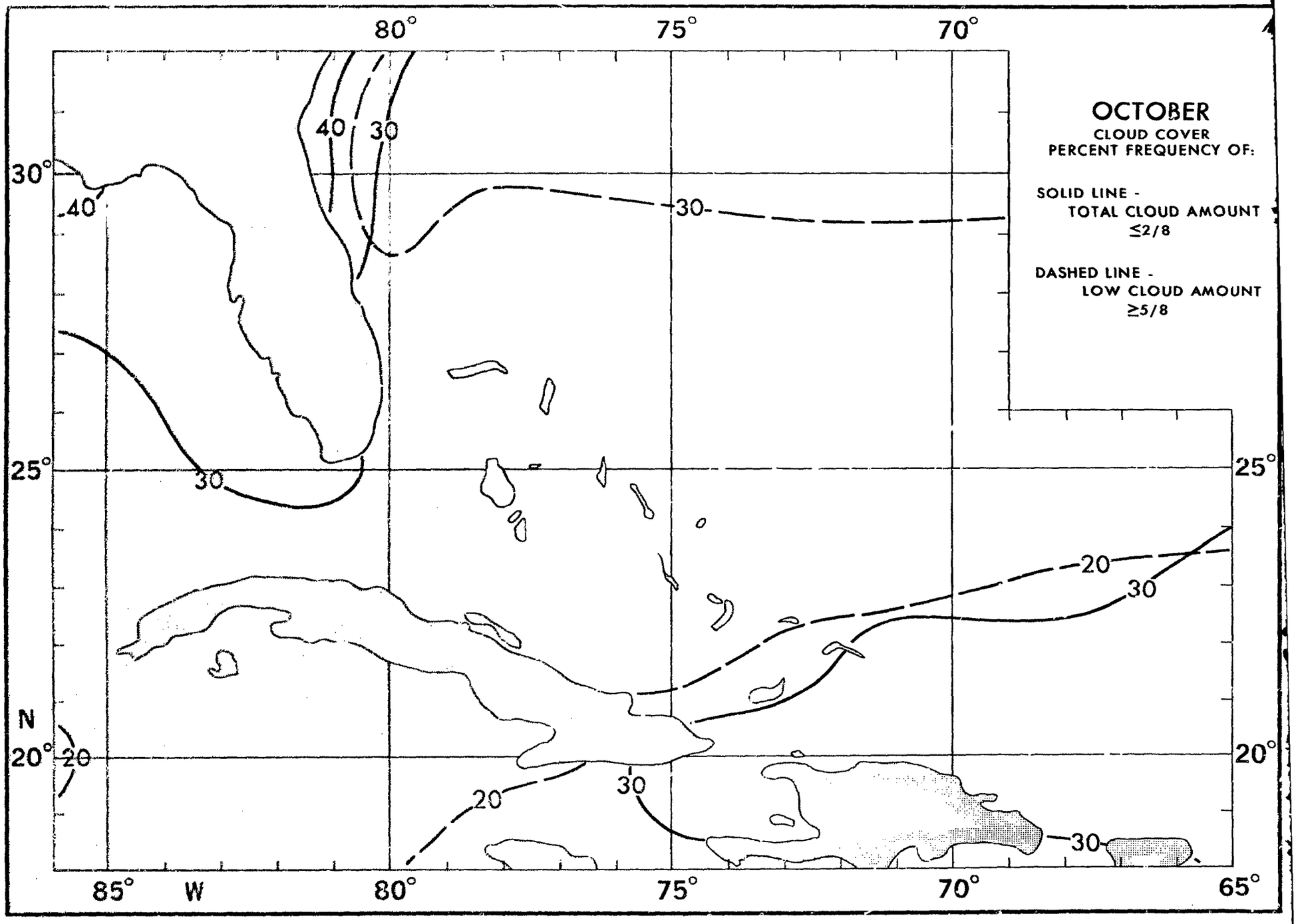

75°
70°
30°
25°
20°
N
75° W
70°
65°
SEPTEMBER
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.

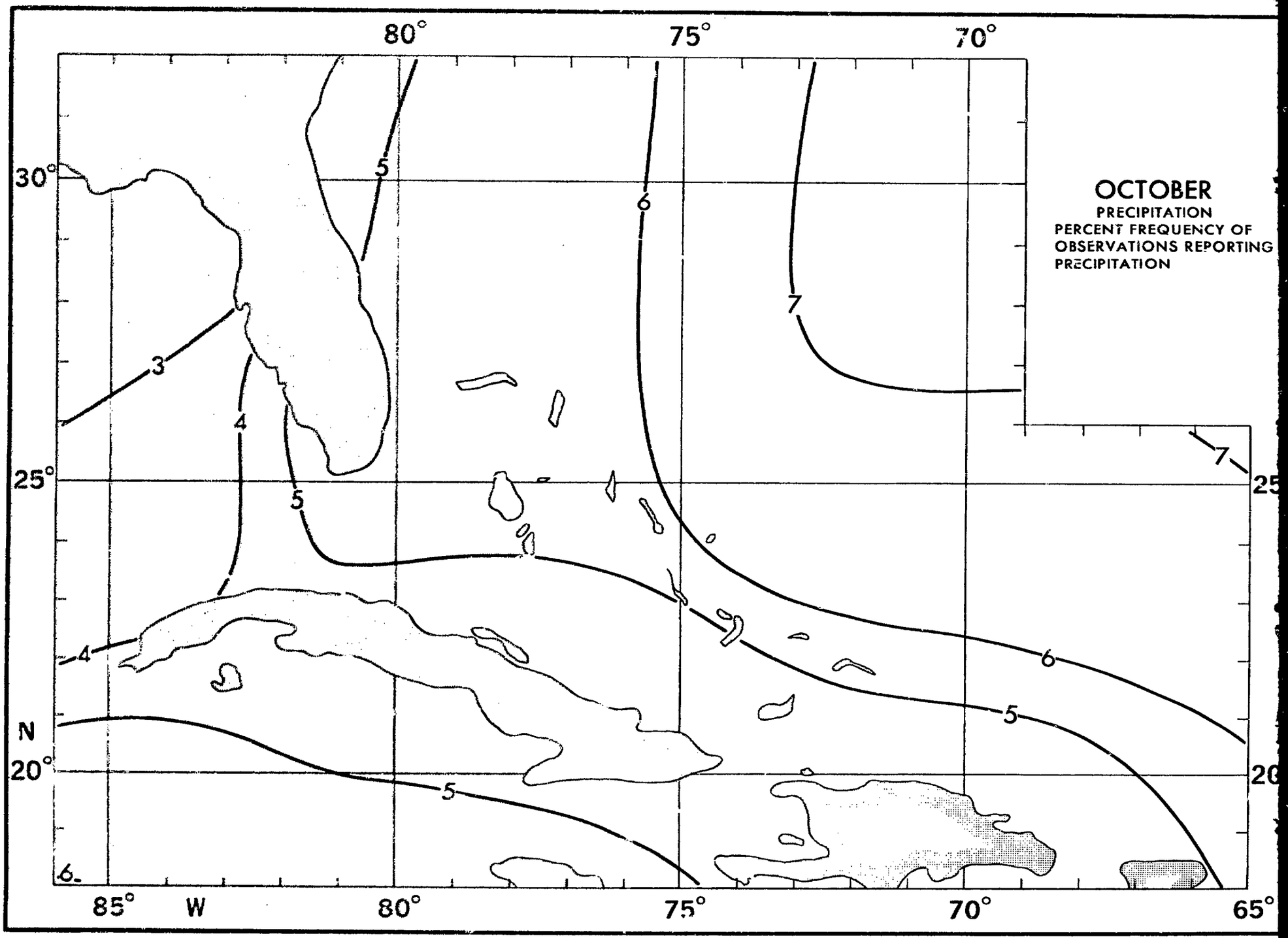

80°
75°
70°
SEPTEMBER
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)
30°
25°
20°
N
85° W
80°
75°
70°
65°

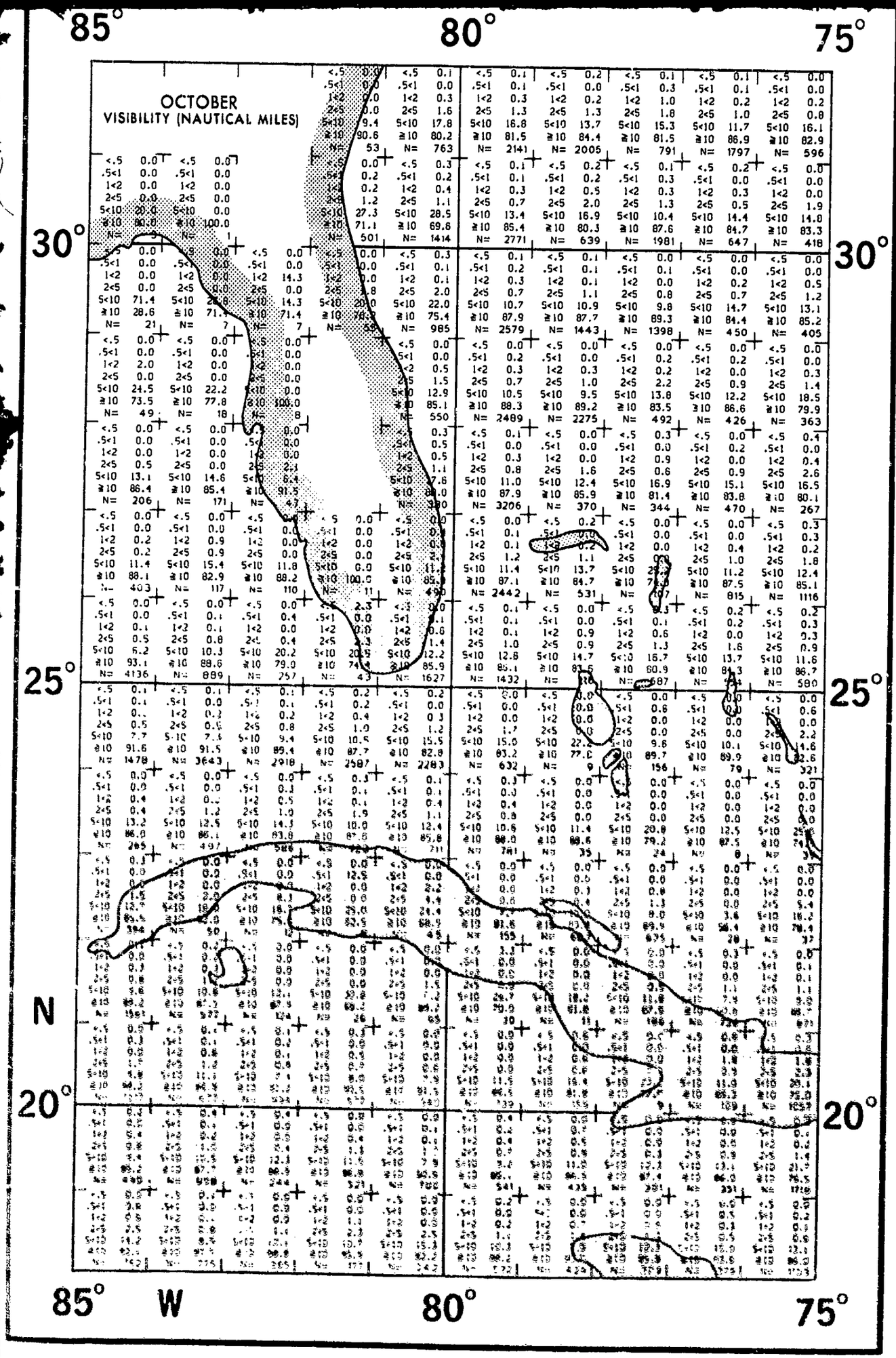

SEPTEMBER
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEET
DASHED LINE -
WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FOR THIS MAP IS THE HIGHER OF SEA OR SWELL FOR OBSERVATIONS CONTAINING BOTH WAVE TRAINS.
SEA IS DEFINED AS WAVES GENERATED BY LOCAL WINDS
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
>10
10
40
50
60
70
80

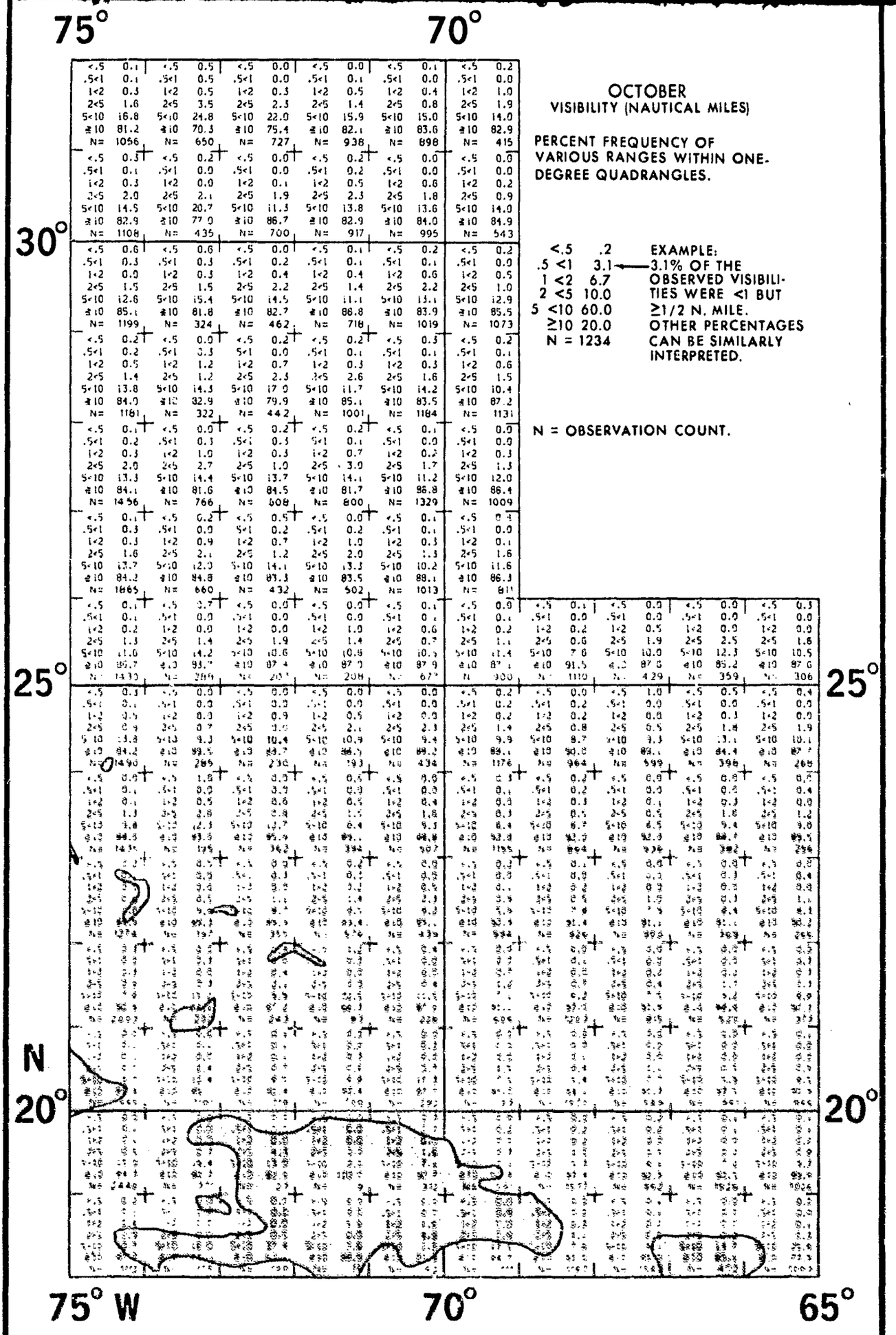

SEPTEMBER
WAVE HEIGHT-FREQUENCIES
85°
80°
75°
30°
25°
20°
N
W


75°
70°
30°
25°
20°
N
75° W
70°
65°
SEPTEMBER
WAVE HEIGHT-FREQUENCIES
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
≤2 10.0
3-4 20.0
5-6 30.0
7-9 20.0
10-12 10.0
≥13 10.0
N = 1363
EXAMPLE:
30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.
N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


80°
75°
70°
OCTOBER
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/8
30°
25°
20°
N
40
30
40
30
30
20
30
20
30
30
85° W
80°
75°
70°
65°


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
OCTOBER
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION
3
4
5
6
7


OCTOBER
VISIBILITY (NAUTICAL MILES)
85°
80°
75°
30°
25°
20°
N
W

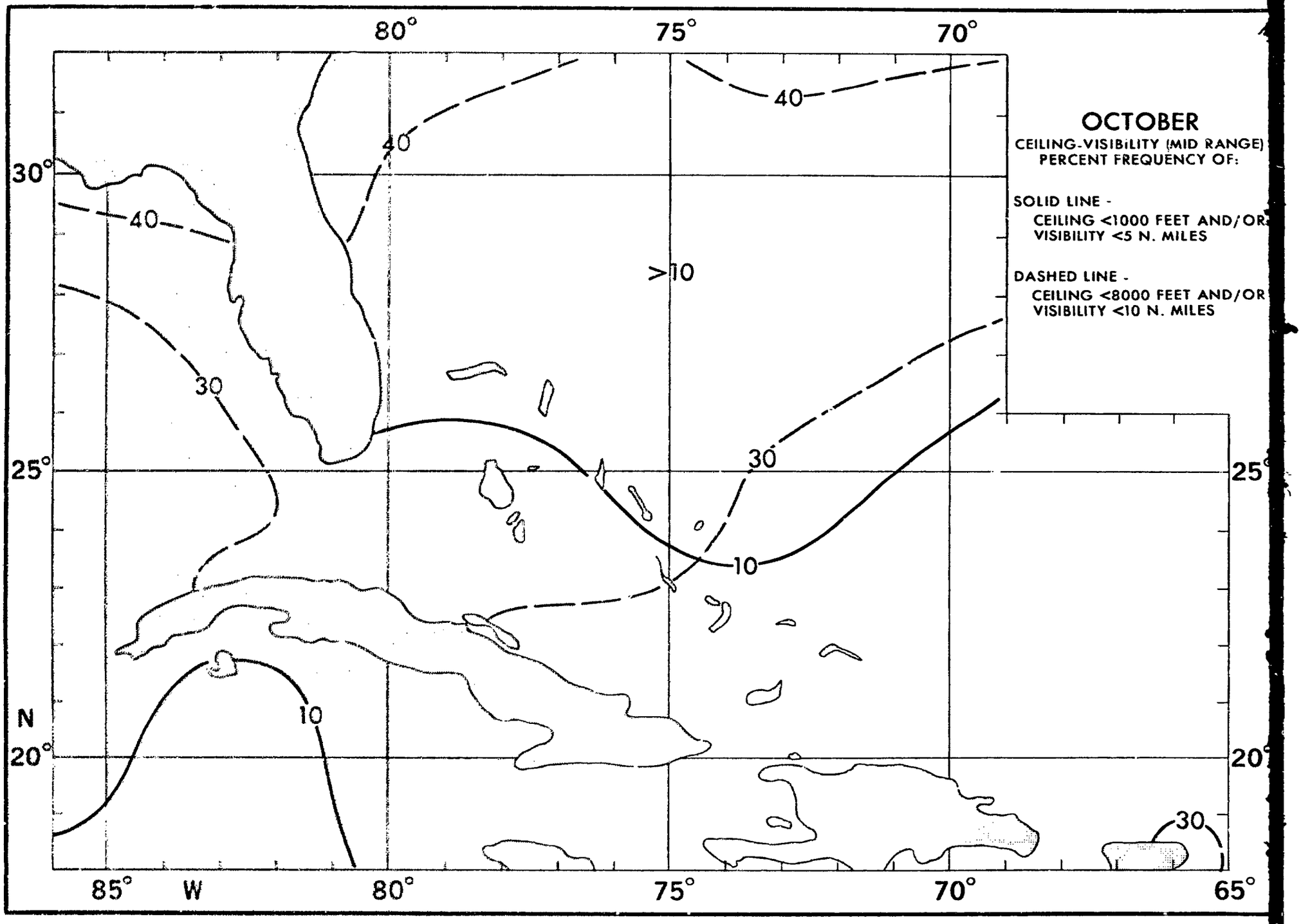


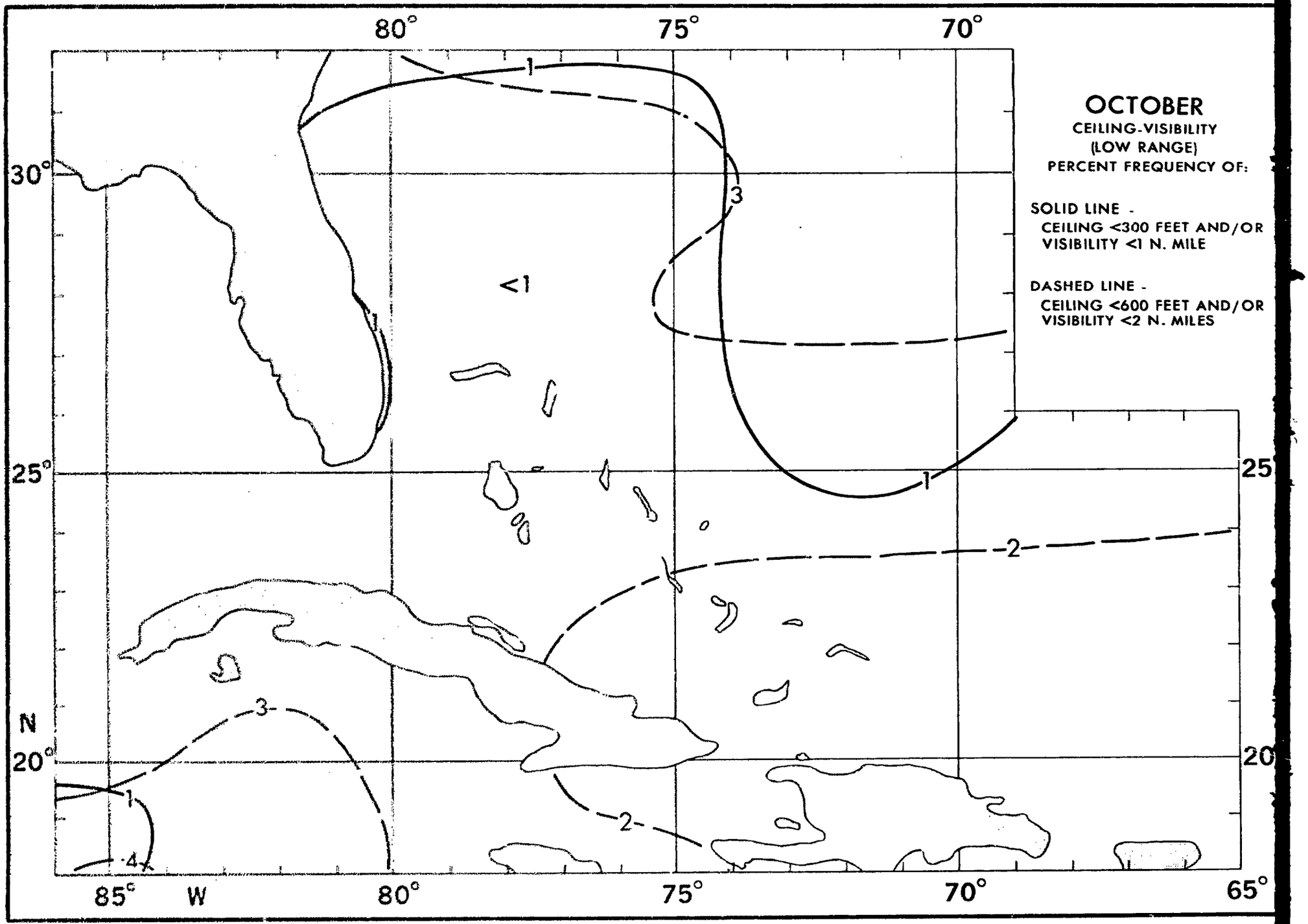
OCTOBER
VISIBILITY (NAUTICAL MILES)

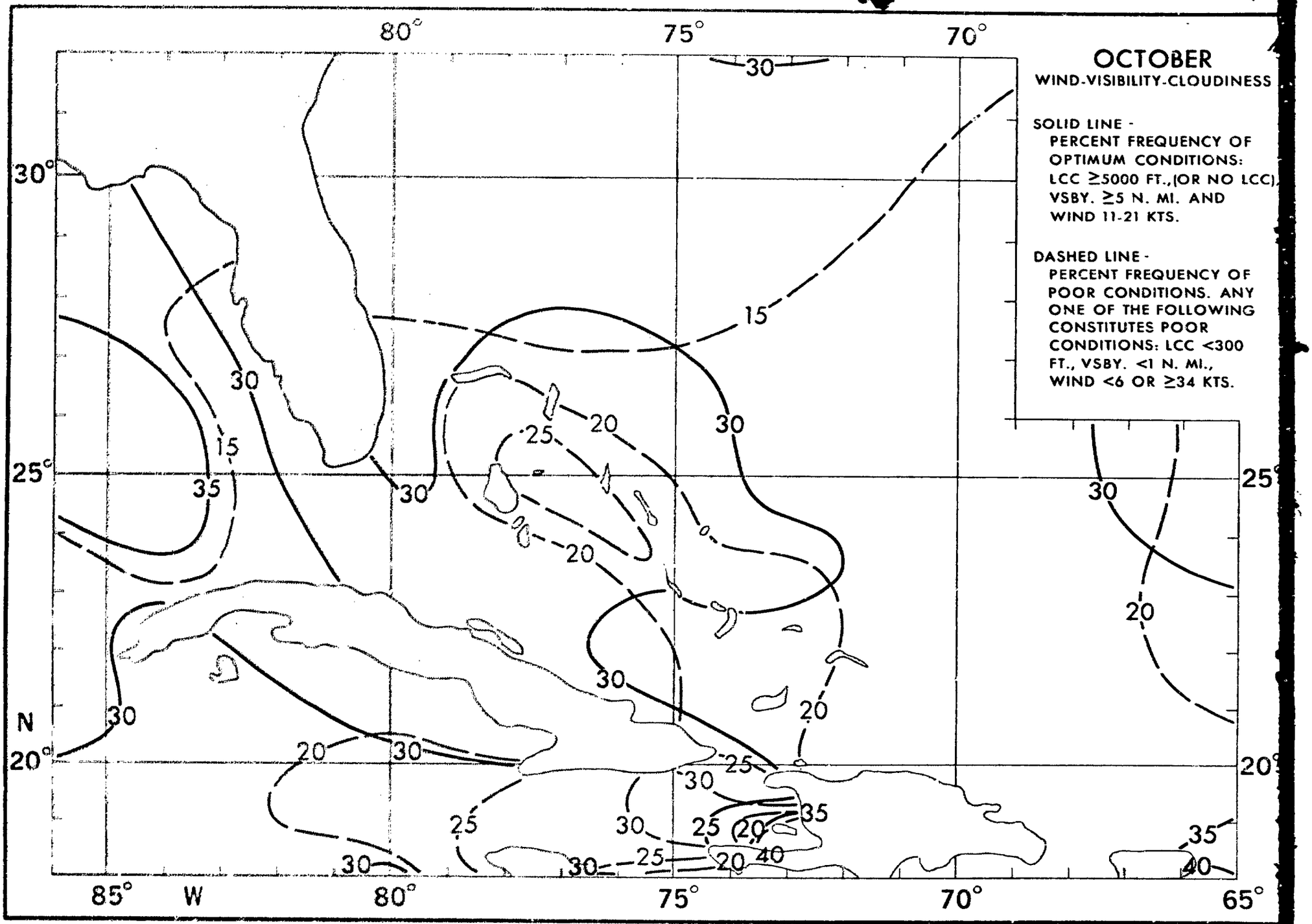
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

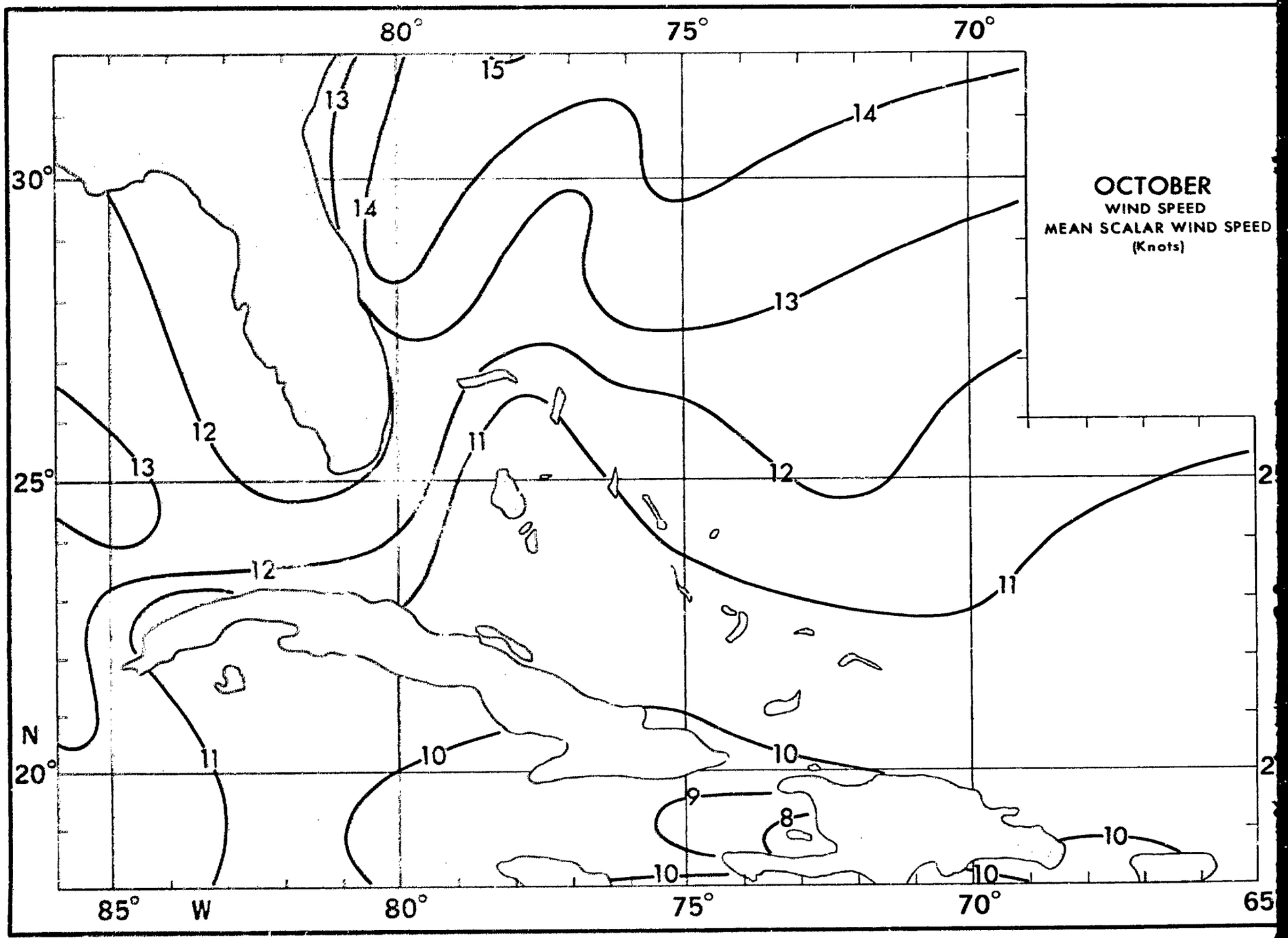
<.5	.2	EXAMPLE:
.5 <1	3.1	← 3.1% OF THE
1 <2	6.7	OBSERVED VISIBILI-
2 <5	10.0	TIES WERE <1 BUT
5 <10	60.0	≥1/2 N. MILE.
≥10	20.0	OTHER PERCENTAGES
N =	1234	CAN BE SIMILARLY INTERPRETED.

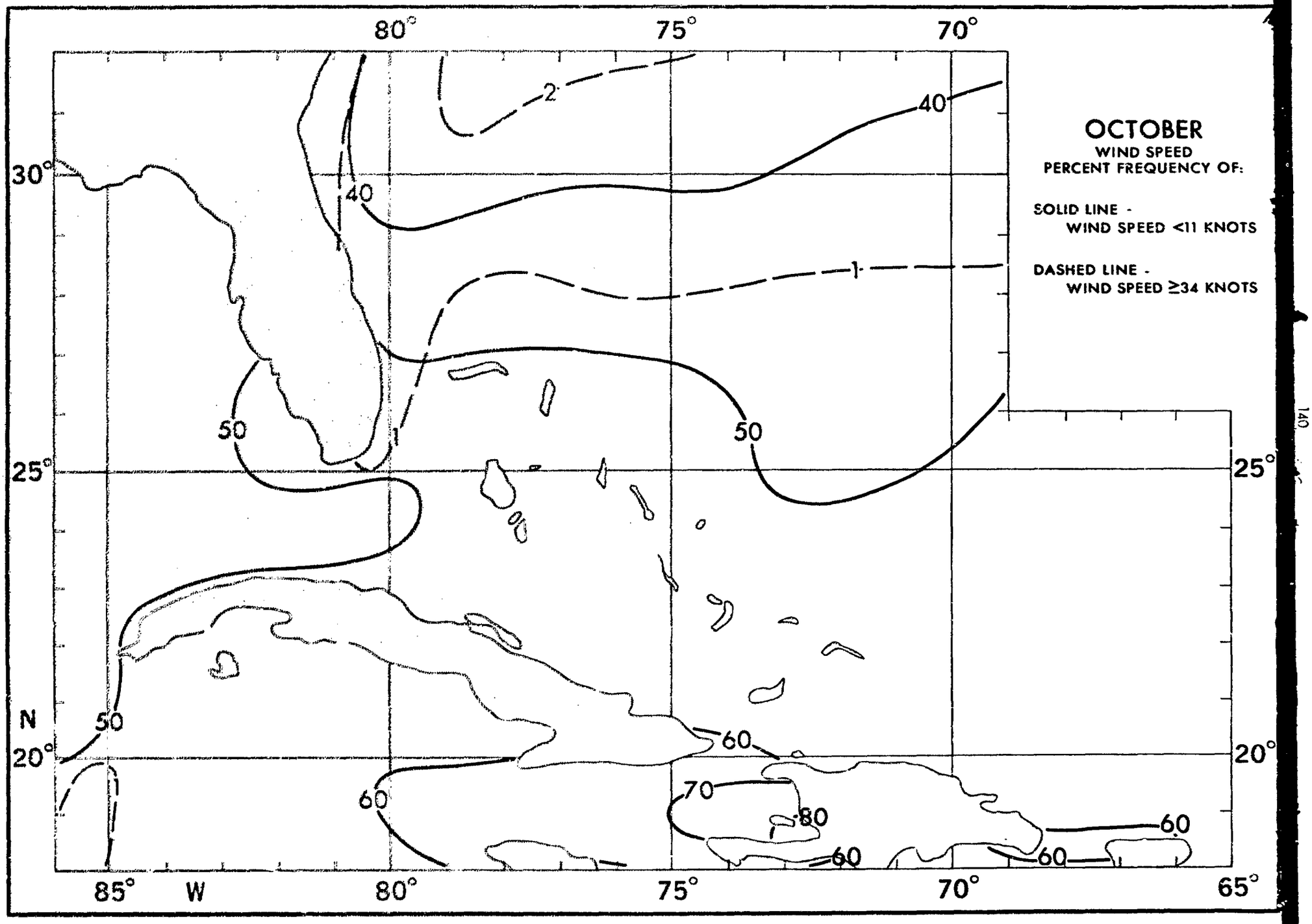
N = OBSERVATION COUNT.

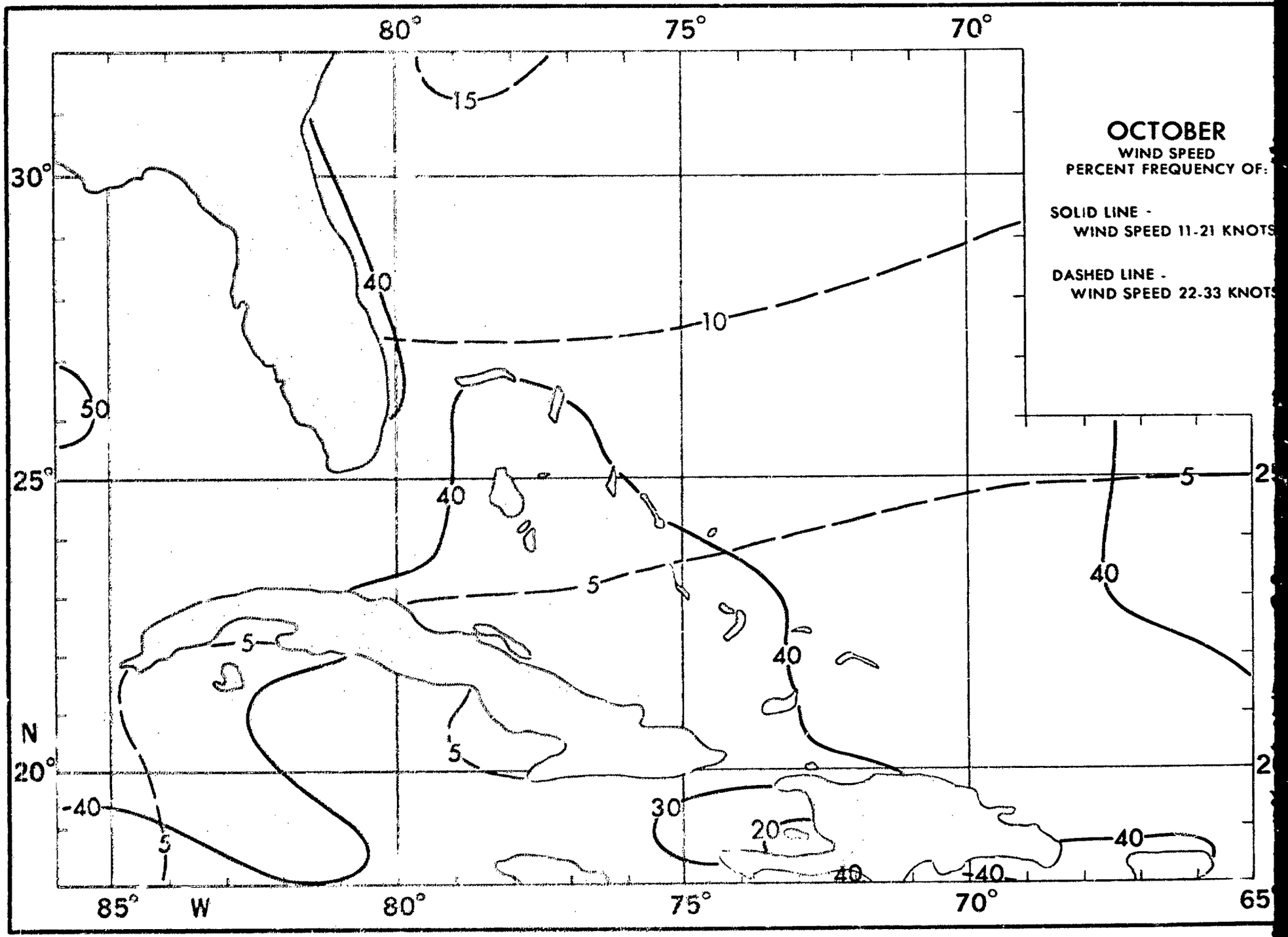

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
40
40
40
30
30
>10
10
10
30
OCTOBER
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES

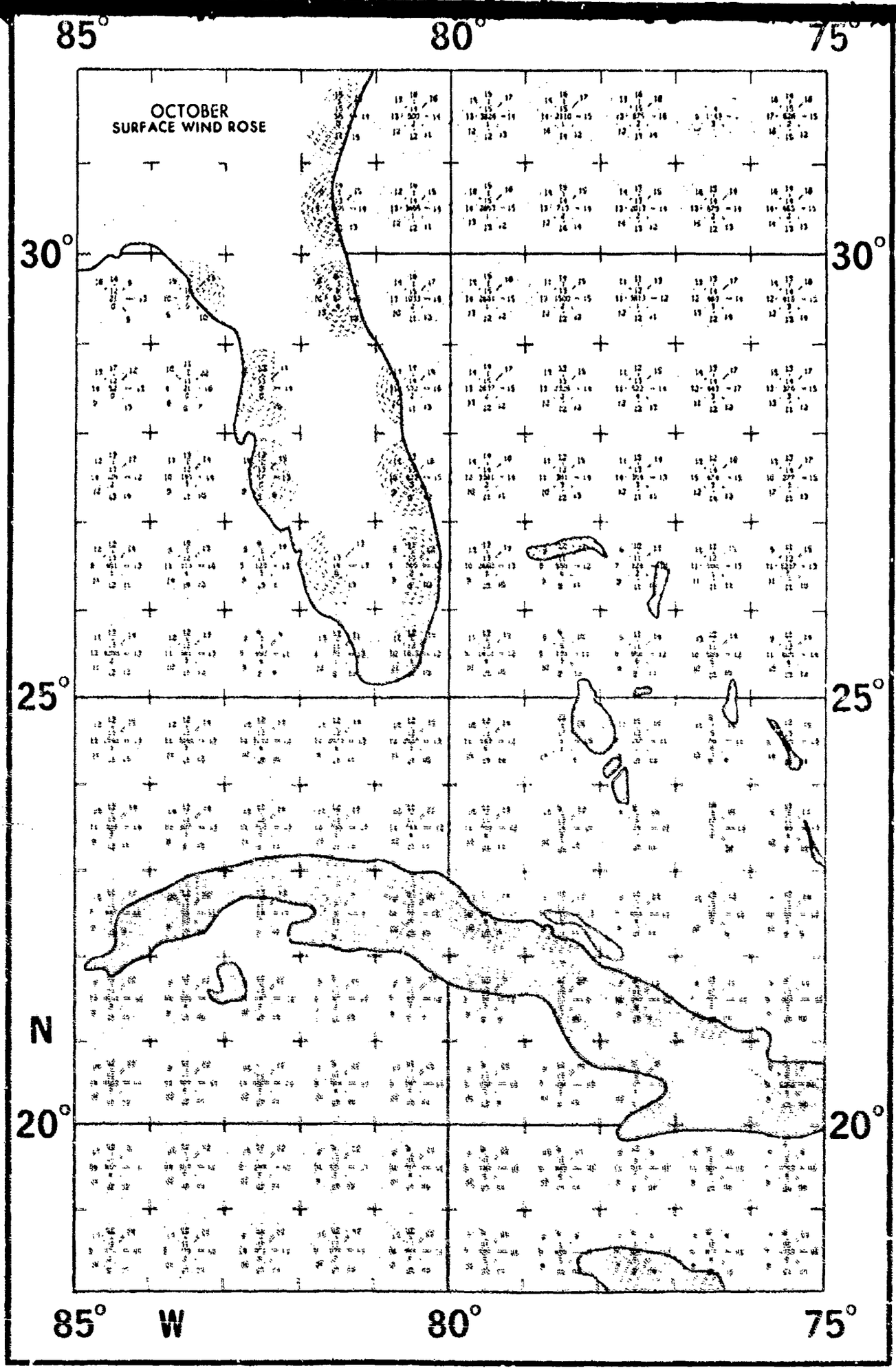

80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°
OCTOBER
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE -
CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES
<1
1
3
2
4

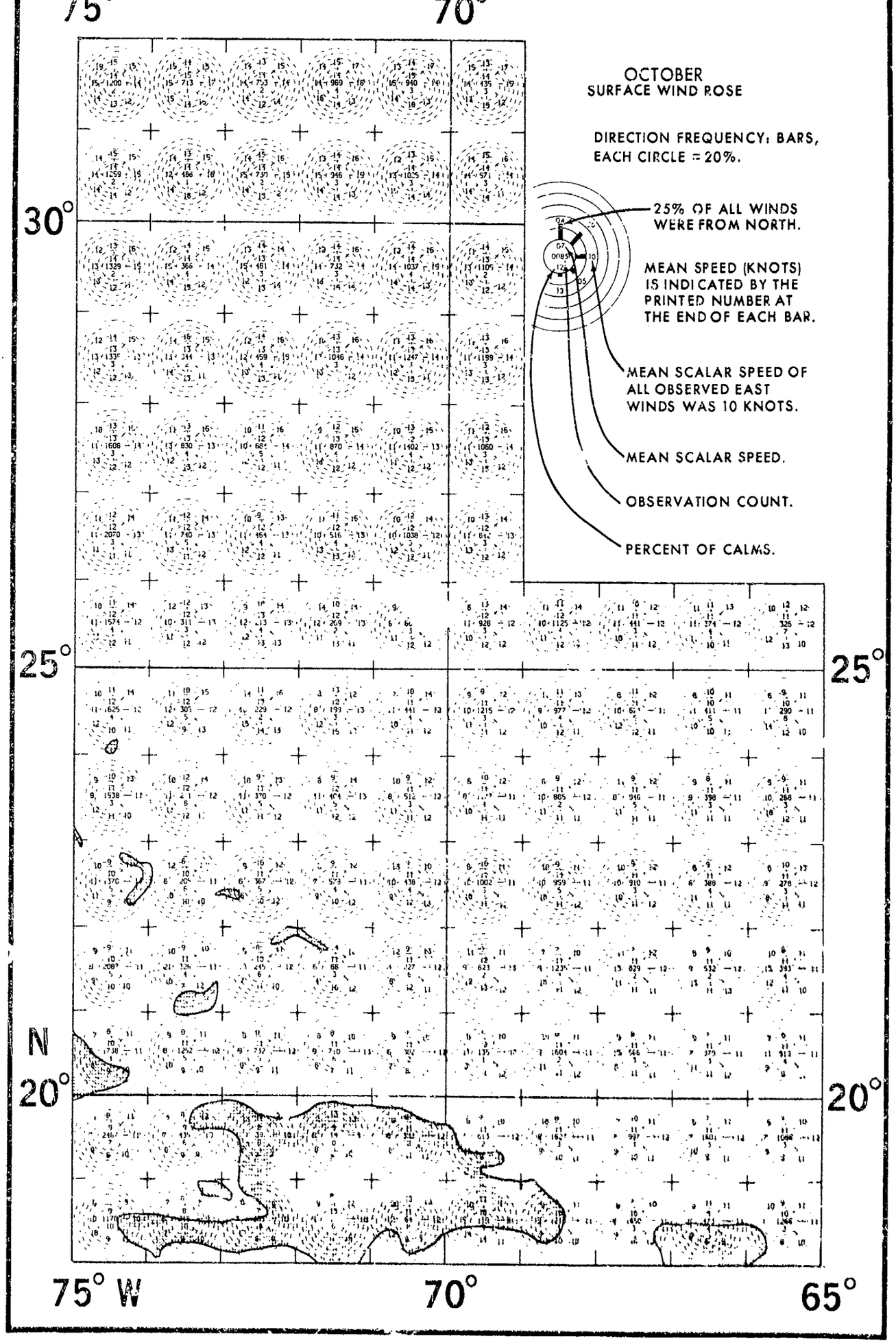

OCTOBER
WIND-VISIBILITY-CLOUDINESS
SOLID LINE - PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE - PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°

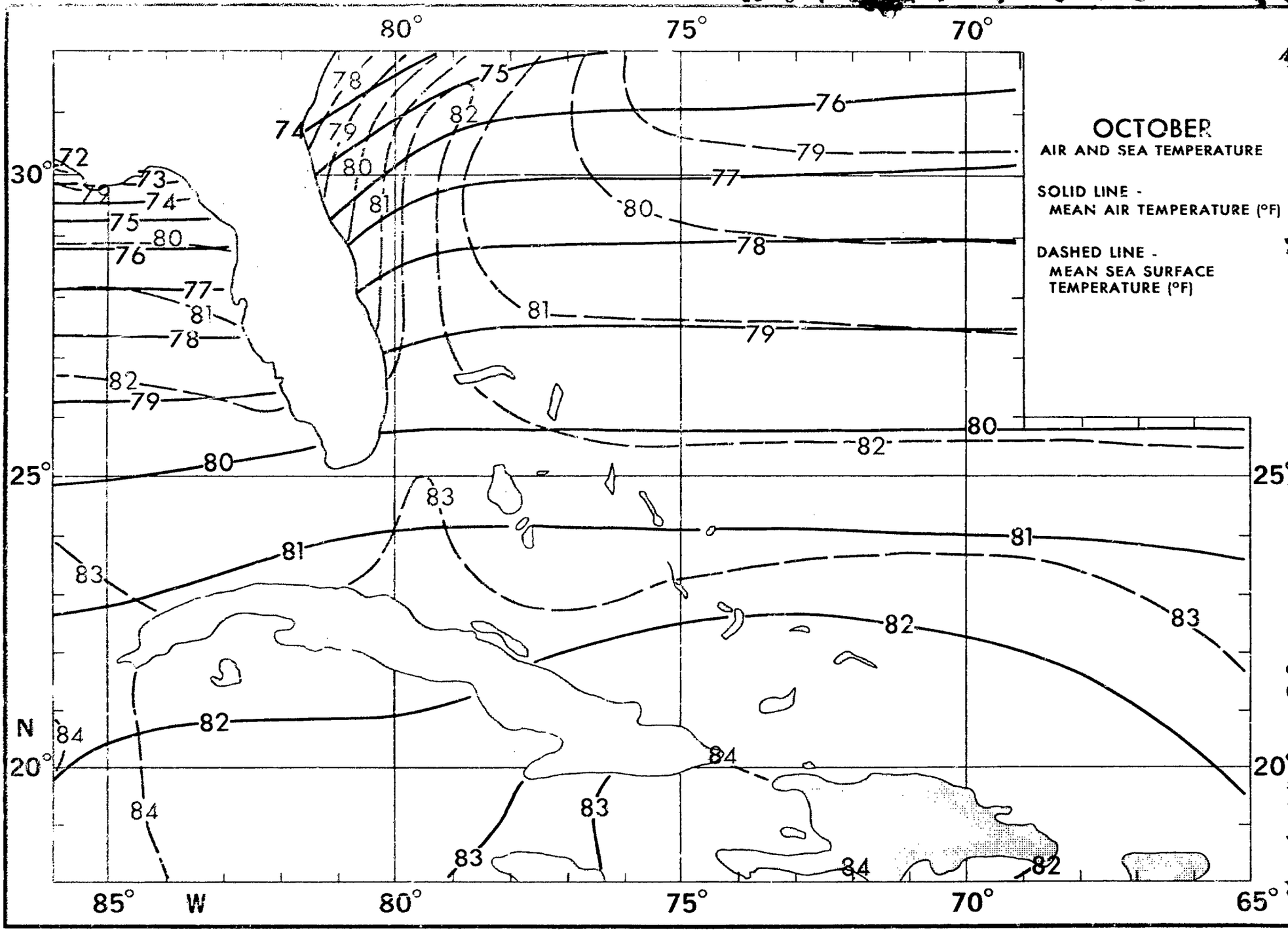

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65
OCTOBER
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)
15
14
13
12
11
10
9
8

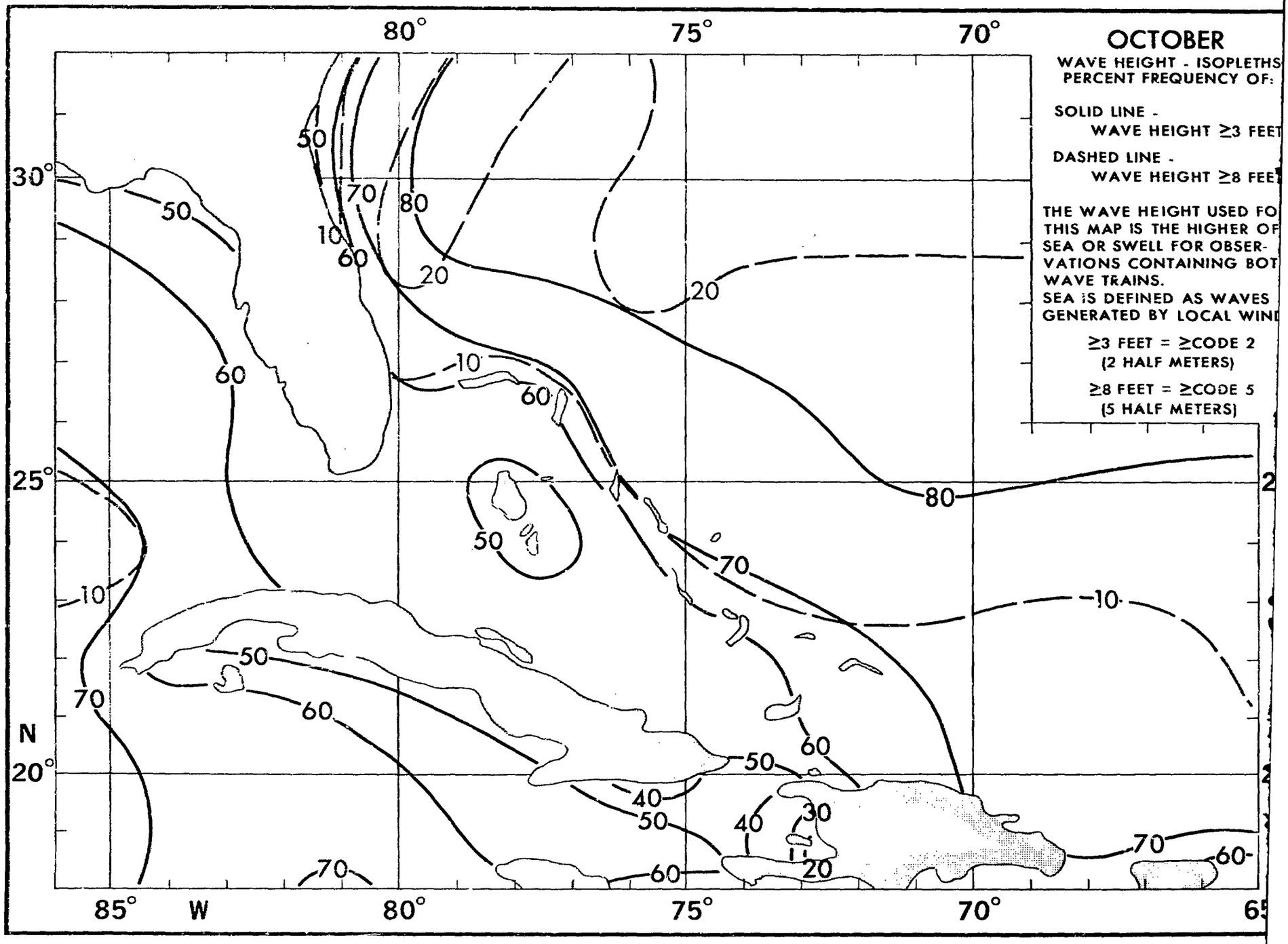

80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°
2
40
40
1
50
1
50
50
60
70
80
60
60
60
OCTOBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS

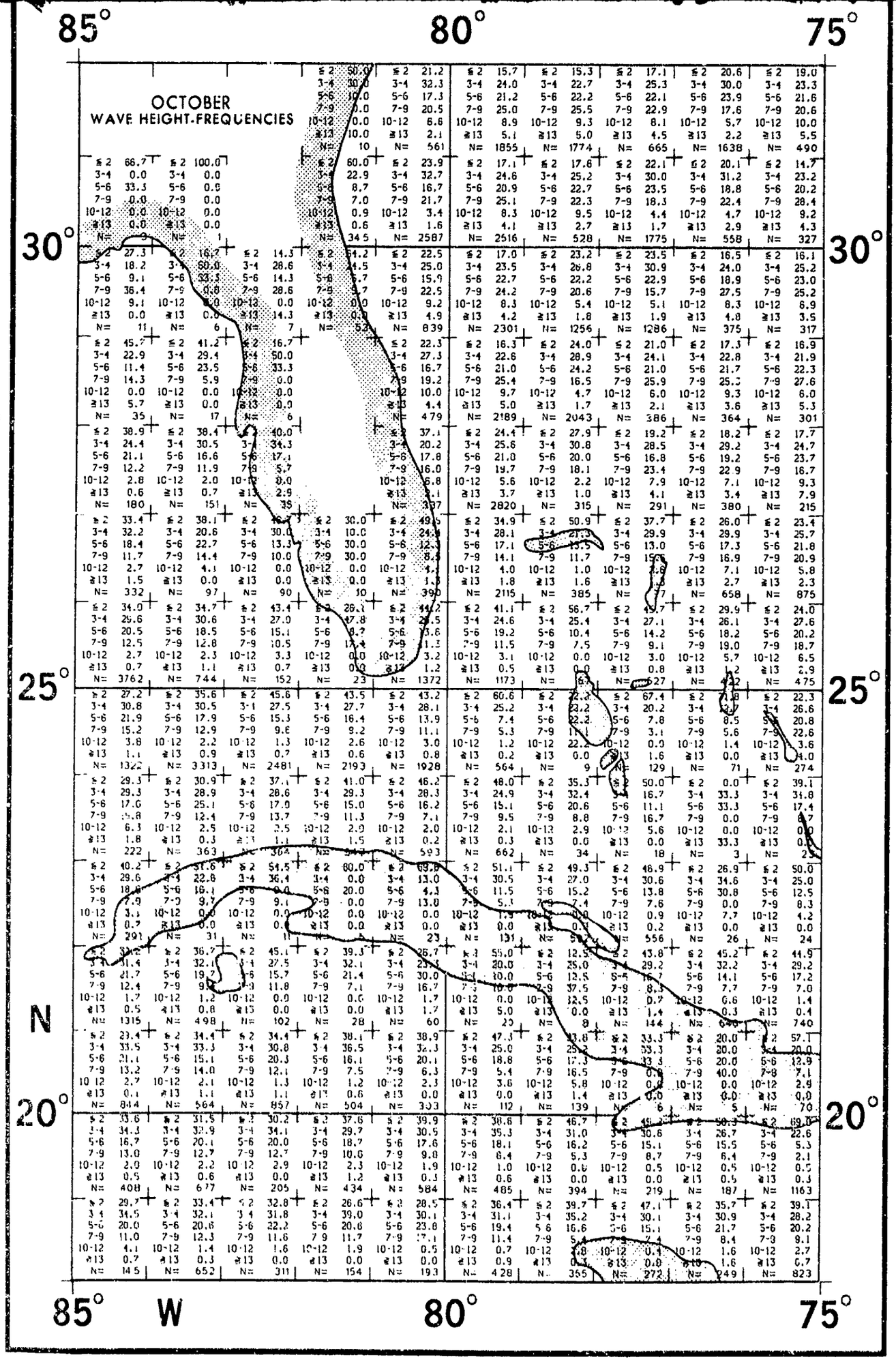

80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65
OCTOBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED 11-21 KNOTS
DASHED LINE -
WIND SPEED 22-33 KNOTS
15
40
10
50
40
5
5
40
5
40
5
40
30
20
40
40
40


OCTOBER
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
W


OCTOBER
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.
75°
70°
30°
25°
20°
N
75° W
70°
65°


OCTOBER
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°


OCTOBER
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEET
DASHED LINE -
WAVE HEIGHT ≥8 FEET
THE WAVE HEIGHT USED FO
THIS MAP IS THE HIGHER OF
SEA OR SWELL FOR OBSER-
VATIONS CONTAINING BOT
WAVE TRAINS.
SEA IS DEFINED AS WAVES
GENERATED BY LOCAL WIN
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°



≤ 2	66.7	≤ 2	100.0
3-4	0.0	3-4	0.0
5-6	33.3	5-6	0.0
7-9	0.0	7-9	0.0
10-12	0.0	10-12	0.0
≥13	0.0	≥13	0.0
N=	3	N=	1

≤ 2	27.3	≤ 2	16.7	≤ 2	14.3
3-4	18.2	3-4	50.0	3-4	28.6
5-6	9.1	5-6	33.3	5-6	14.3
7-9	36.4	7-9	0.0	7-9	28.6
10-12	9.1	10-12	0.0	10-12	0.0
≥13	0.0	≥13	0.0	≥13	14.3
N=	11	N=	6	N=	7

≤ 2	45.7	≤ 2	41.2	≤ 2	16.7
3-4	22.9	3-4	29.4	3-4	50.0
5-6	11.4	5-6	23.5	5-6	33.3
7-9	14.3	7-9	5.9	7-9	0.0
10-12	0.0	10-12	0.0	10-12	0.0
≥13	5.7	≥13	0.0	≥13	0.0
N=	35	N=	17	N=	6

≤ 2	38.9	≤ 2	38.4	≤ 2	40.0
3-4	24.4	3-4	30.5	3-4	34.3
5-6	21.1	5-6	16.6	5-6	17.1
7-9	12.2	7-9	11.9	7-9	5.7
10-12	2.8	10-12	2.0	10-12	0.0
≥13	0.6	≥13	0.7	≥13	2.9
N=	180	N=	151	N=	35

≤ 2	33.4	≤ 2	38.1	≤ 2	46.7
3-4	32.2	3-4	20.6	3-4	30.0
5-6	18.4	5-6	22.7	5-6	13.3
7-9	11.7	7-9	14.4	7-9	10.0
10-12	2.7	10-12	4.1	10-12	0.0
≥13	1.5	≥13	0.0	≥13	0.0
N=	332	N=	97	N=	90

≤ 2	34.0	≤ 2	34.7	≤ 2	43.4
3-4	26.6	3-4	30.6	3-4	27.0
5-6	20.5	5-6	18.5	5-6	15.1
7-9	12.5	7-9	12.8	7-9	10.5
10-12	2.7	10-12	2.3	10-12	3.3
≥13	0.7	≥13	1.1	≥13	0.7
N=	3762	N=	744	N=	152

≤ 2	27.2	≤ 2	35.6	≤ 2	45.6
3-4	30.8	3-4	30.5	3-4	27.5
5-6	21.9	5-6	17.9	5-6	15.3
7-9	15.2	7-9	12.9	7-9	9.6
10-12	3.8	10-12	2.2	10-12	1.3
≥13	1.1	≥13	0.9	≥13	0.7
N=	1322	N=	3313	N=	2481

≤ 2	29.3	≤ 2	30.9	≤ 2	37.1
3-4	29.3	3-4	28.9	3-4	28.6
5-6	17.6	5-6	25.1	5-6	17.0
7-9	15.8	7-9	12.4	7-9	13.7
10-12	6.3	10-12	2.5	10-12	3.5
≥13	1.8	≥13	0.3	≥13	1.1
N=	222	N=	363	N=	364

≤ 2	40.2	≤ 2	31.6	≤ 2	54.5
3-4	29.6	3-4	22.8	3-4	36.4
5-6	18.8	5-6	18.1	5-6	0.0
7-9	7.9	7-9	9.7	7-9	9.1
10-12	3.1	10-12	0.0	10-12	0.0
≥13	0.7	≥13	0.0	≥13	0.0
N=	291	N=	31	N=	11

≤ 2	31.2	≤ 2	36.7	≤ 2	45.1
3-4	31.4	3-4	32.1	3-4	27.5
5-6	21.7	5-6	19.7	5-6	15.7
7-9	12.4	7-9	9.6	7-9	11.8
10-12	1.7	10-12	1.2	10-12	0.0
≥13	0.5	≥13	0.8	≥13	0.0
N=	1315	N=	498	N=	102

≤ 2	23.4	≤ 2	34.4	≤ 2	34.4
3-4	33.5	3-4	33.3	3-4	30.8
5-6	21.1	5-6	15.1	5-6	20.3
7-9	13.2	7-9	14.0	7-9	12.1
10-12	2.7	10-12	2.1	10-12	1.3
≥13	0.1	≥13	1.1	≥13	1.1
N=	844	N=	564	N=	857

≤ 2	33.6	≤ 2	31.5	≤ 2	30.2
3-4	34.3	3-4	32.9	3-4	34.1
5-6	16.7	5-6	20.1	5-6	20.0
7-9	13.0	7-9	12.7	7-9	12.7
10-12	2.0	10-12	2.2	10-12	2.9
≥13	0.5	≥13	0.6	≥13	0.0
N=	408	N=	677	N=	205

≤ 2	29.7	≤ 2	33.4	≤ 2	32.8
3-4	34.5	3-4	32.1	3-4	31.8
5-6	20.0	5-6	20.6	5-6	22.2
7-9	11.0	7-9	12.3	7-9	11.6
10-12	4.1	10-12	1.4	10-12	1.6
≥13	0.7	≥13	0.3	≥13	0.0
N=	145	N=	652	N=	311

≤ 2	50.0	≤ 2	21.2
3-4	30.0	3-4	32.3
5-6	10.0	5-6	17.3
7-9	0.0	7-9	20.5
10-12	0.0	10-12	6.6
≥13	10.0	≥13	2.1
N=	10	N=	561

≤ 2	60.0	≤ 2	23.9
3-4	22.9	3-4	32.7
5-6	8.7	5-6	16.7
7-9	7.0	7-9	21.7
10-12	0.9	10-12	3.4
≥13	0.6	≥13	1.6
N=	345	N=	2587

≤ 2	54.2	≤ 2	22.5
3-4	24.5	3-4	25.0
5-6	6.7	5-6	15.9
7-9	5.7	7-9	22.5
10-12	0.0	10-12	9.2
≥13	0.0	≥13	4.9
N=	52	N=	839

≤ 2	22.3
3-4	27.3
5-6	16.7
7-9	19.2
10-12	10.0
≥13	4.4
N=	479

≤ 2	37.1
3-4	20.2
5-6	17.8
7-9	16.0
10-12	6.8
≥13	2.1
N=	397

≤ 2	30.0	≤ 2	49.5
3-4	10.0	3-4	24.4
5-6	30.0	5-6	12.3
7-9	30.0	7-9	8.5
10-12	0.0	10-12	4.2
≥13	0.0	≥13	1.3
N=	10	N=	390

≤ 2	26.3	≤ 2	44.2
3-4	47.8	3-4	28.5
5-6	8.7	5-6	13.6
7-9	17.4	7-9	11.3
10-12	0.0	10-12	3.2
≥13	0.0	≥13	1.2
N=	23	N=	1372

≤ 2	43.5	≤ 2	43.2
3-4	27.7	3-4	28.1
5-6	16.4	5-6	13.9
7-9	9.2	7-9	11.1
10-12	2.6	10-12	3.0
≥13	0.6	≥13	0.8
N=	2193	N=	1928

≤ 2	41.0	≤ 2	46.2
3-4	29.3	3-4	28.3
5-6	15.0	5-6	16.2
7-9	11.3	7-9	7.1
10-12	2.0	10-12	2.0
≥13	1.5	≥13	0.2
N=	344	N=	593

≤ 2	60.0	≤ 2	69.0
3-4	0.0	3-4	13.0
5-6	20.0	5-6	4.3
7-9	0.0	7-9	13.0
10-12	0.0	10-12	0.0
≥13	0.0	≥13	0.0
N=	5	N=	23

≤ 2	39.3	≤ 2	26.7
3-4	32.1	3-4	23.1
5-6	21.4	5-6	30.0
7-9	7.1	7-9	16.7
10-12	0.0	10-12	1.7
≥13	0.0	≥13	1.7
N=	504	N=	303

≤ 2	37.6	≤ 2	39.9
3-4	29.7	3-4	30.5
5-6	18.7	5-6	17.6
7-9	10.6	7-9	9.8
10-12	2.3	10-12	1.9
≥13	1.2	≥13	0.3
N=	434	N=	584

≤ 2	26.6	≤ 2	28.5
3-4	39.0	3-4	30.1
5-6	20.8	5-6	23.8
7-9	11.7	7-9	12.1
10-12	1.9	10-12	0.5
≥13	0.0	≥13	0.0
N=	154	N=	193

≤ 2	15.7	≤ 2	15.3	≤ 2	17.1	≤ 2	20.6	≤ 2	19.0
3-4	24.0	3-4	22.7	3-4	25.3	3-4	30.0	3-4	23.3
5-6	21.2	5-6	22.2	5-6	22.1	5-6	23.9	5-6	21.6
7-9	25.0	7-9	25.5	7-9	22.9	7-9	17.6	7-9	20.6
10-12	8.9	10-12	9.3	10-12	8.1	10-12	5.7	10-12	10.0
≥13	5.1	≥13	5.0	≥13	4.5	≥13	2.2	≥13	5.5
N=	1855	N=	1774	N=	665	N=	1638	N=	490

≤ 2	17.1	≤ 2	17.6	≤ 2	22.1	≤ 2	20.1	≤ 2	14.7
3-4	24.6	3-4	25.2	3-4	30.0	3-4	31.2	3-4	23.2
5-6	20.9	5-6	22.7	5-6	23.5	5-6	18.8	5-6	20.2
7-9	25.1	7-9	22.3	7-9	18.3	7-9	22.4	7-9	28.4
10-12	8.3	10-12	9.5	10-12	4.4	10-12	4.7	10-12	9.2
≥13	4.1	≥13	2.7	≥13	1.7	≥13	2.9	≥13	4.3
N=	2516	N=	528	N=	1775	N=	558	N=	327

≤ 2	17.0	≤ 2	23.2	≤ 2	23.5	≤ 2	16.5	≤ 2	16.1
3-4	23.5	3-4	26.8	3-4	30.9	3-4	24.0	3-4	25.2
5-6	22.7	5-6	22.2	5-6	22.9	5-6	18.9	5-6	23.0
7-9	24.2	7-9	20.6	7-9	15.7	7-9	27.5	7-9	25.2
10-12	8.3	10-12	5.4	10-12	5.1	10-12	8.3	10-12	6.9
≥13	4.2	≥13	1.8	≥13	1.9	≥13	4.8	≥13	3.5
N=	2301	N=	1256	N=	1286	N=	375	N=	317

≤ 2	16.3	≤ 2	24.0	≤ 2	21.0	≤ 2	17.3	≤ 2	16.9
3-4	22.6	3-4	28.9	3-4	24.1	3-4	22.8	3-4	21.9
5-6	21.0	5-6	24.2	5-6	21.0	5-6	21.7	5-6	22.3
7-9	25.4	7-9	16.5	7-9	25.9	7-9	25.3	7-9	27.6
10-12	9.7	10-12	4.7	10-12	6.0	10-12	9.3	10-12	6.0
≥13	5.0	≥13	1.7	≥13	2.1	≥13	3.6	≥13	5.3
N=	2189	N=	2043	N=	386	N=	364	N=	301

≤ 2	24.4	≤ 2	27.9	≤ 2	19.2	≤ 2	18.2	≤ 2	17.7
3-4	25.6	3-4	30.8	3-4	28.5	3-4	29.2	3-4	24.7
5-6	21.0	5-6	20.0	5-6	16.8	5-6	19.2	5-6	23.7
7-9	19.7	7-9	18.1	7-9	23.4	7-9	22.9	7-9	16.7
10-12	5.6	10-12	2.2	10-12	7.9	10-12	7.1	10-12	9.3
≥13	3.7	≥13	1.0	≥13	4.1	≥13	3.4	≥13	7.9
N=	2820	N=	315	N=	291	N=	380	N=	215

≤ 2	34.9	≤ 2	50.9	≤ 2	37.7	≤ 2	26.0	≤ 2	23.4
3-4	28.1	3-4	21.3	3-4	29.9	3-4	29.9	3-4	25.7
5-6	17.1	5-6	13.5	5-6	13.0	5-6	17.3	5-6	21.8
7-9	14.1	7-9	11.7	7-9	15.6	7-9	16.9	7-9	20.9
10-12	4.0	10-12	1.0	10-12	2.0	10-12	7.1	10-12	5.8
≥13	1.8	≥13	1.6	≥13	1.0	≥13	2.7	≥13	2.3
N=	2115	N=	385	N=	177	N=	658	N=	875

≤ 2	41.1	≤ 2	56.7	≤ 2	49.7	≤ 2	29.9	≤ 2	24.0
3-4	24.6	3-4	25.4	3-4	27.1	3-4	26.1	3-4	27.6
5-6	19.2	5-6	10.4	5-6	14.2	5-6	18.2	5-6	20.2
7-9	11.5	7-9	7.5	7-9	9.1	7-9	19.0	7-9	18.7
10-12	3.1	10-12	0.0	10-12	3.0	10-12	5.7	10-12	6.5
≥13	0.5	≥13	0.0	≥13	0.8	≥13	1.2	≥13	2.9
N=	1173	N=	667	N=	527	N=	432	N=	475

≤ 2	60.6	≤ 2	22.8	≤ 2	67.4	≤ 2	21.8	≤ 2	22.3
3-4	25.2	3-4	23.2	3-4	20.2	3-4	32.7	3-4	26.6
5-6	7.4	5-6	22.2	5-6	7.8	5-6	8.5	5-6	20.8
7-9	5.3	7-9	11.1	7-9	3.1	7-9	5.6	7-9	22.6
10-12	1.2	10-12	22.2	10-12	0.0	10-12	1.4	10-12	3.6
≥13	0.2	≥13	0.0	≥13	1.6	≥13	0.0	≥13	4.0
N=	564	N=	9	N=	129	N=	71	N=	274

≤ 2	48.0	≤ 2	35.3	≤ 2	50.0	≤ 2	0.0	≤ 2	39.1
3-4	24.9	3-4	32.4	3-4	16.7	3-4	33.3	3-4	34.8
5-6	15.1	5-6	20.6	5-6	11.1	5-6	33.3	5-6	17.4
7-9	9.5	7-9	8.8	7-9	16.7	7-9	0.0	7-9	8.7
10-12	2.1	10-12	2.9	10-12	5.6	10-12	0.0	10-12	0.0
≥13	0.3	≥13	0.0	≥13	0.0	≥13	33.3	≥13	0.0
N=	662	N=	34	N=	18	N=	3	N=	23

≤ 2	51.1	≤ 2	49.3	≤ 2	46.9	≤ 2	26.9	≤ 2	50.0
3-4	30.5	3-4	27.0	3-4	30.6	3-4	34.6	3-4	25.0
5-6	11.5	5-6	15.2	5-6	13.8	5-6	30.8	5-6	12.5
7-9	5.3	7-9	7.4	7-9	7.6	7-9	0.0	7-9	8.3
10-12	1.9	10-12	0.0	10-12	0.9	10-12	7.7	10-12	4.2
≥13	0.0	≥13	0.0	≥13	0.2	≥13	0.0	≥13	0.0
N=	131	N=	92	N=	556	N=	26	N=	24

≤ 2	55.0	≤ 2	12.5	≤ 2	43.8	≤ 2	45.2	≤ 2	44.9
3-4	20.0	3-4	25.0	3-4	29.2	3-4	32.2	3-4	29.2
5-6	10.0	5-6	12.5	5-6	16.7	5-6	14.1	5-6	17.2
7-9	10.0	7-9	37.5	7-9	8.3	7-9	7.7	7-9	7.0
10-12	0.0	10-12	12.5	10-12	0.7	10-12	6.6	10-12	1.4
≥13	5.0	≥13	0.0	≥13	1.4	≥13	0.3	≥13	0.4
N=	20	N=	8	N=	144	N=	606	N=	740

≤ 2	47.3	≤ 2	33.8	≤ 2	33.3	≤ 2	20.0	≤ 2	57.1
3-4	25.0	3-4	25.2	3-4	33.3	3-4	20.0	3-4	20.0
5-6	18.8	5-6	17.3	5-6	33.3	5-6	20.0	5-6	13.9
7-9	5.4	7-9	16.5	7-9	0.0	7-9	40.0	7-9	7.1
10-12	3.6	10-12	5.8	10-12	0.0	10-12	0.0	10-12	2.9
≥13	0.0	≥13	1.4	≥13	0.0	≥13	0.0	≥13	0.0
N=	112	N=	139	N=	6	N=	5	N=	70

≤ 2	38.6	≤ 2	46.7	≤ 2	45.2	≤ 2	50.3	≤ 2	69.8
3-4	35.3	3-4	31.0	3-4	30.6	3-4	26.7	3-4	22.6
5-6	18.1	5-6	16.2	5-6	15.1	5-6	15.5	5-6	5.3
7-9	8.4	7-9	5.3	7-9	8.7	7-9	6.4	7-9	2.1
10-12	1.0	10-12	0.6	10-12	0.5	10-12	0.5	10-12	0.5
≥13	0.6	≥13	0.0	≥13	0.0	≥13	0.5	≥13	0.5
N=	485	N=	394	N=	219	N=	187	N=	1163

≤ 2	36.4	≤ 2	39.7	≤ 2	47.1	≤ 2	35.7	≤ 2	39.1
3-4	31.1	3-4	35.2	3-4	30.1	3-4	30.9	3-4	28.2
5-6	19.4	5-6	16.6	5-6	15.1	5-6	21.7	5-6	20.2
7-9	11.4	7-9	5.4	7-9	7.4	7-9	8.4	7-9	9.1
10-12	0.7	10-12	1.8	10-12	0.4	10-12	1.6	10-12	2.7
≥13	0.9	≥13	0.0	≥13	0.0	≥13	1.6	≥13	0.7
N=	428	N=	355	N=	272	N=	249	N=	823

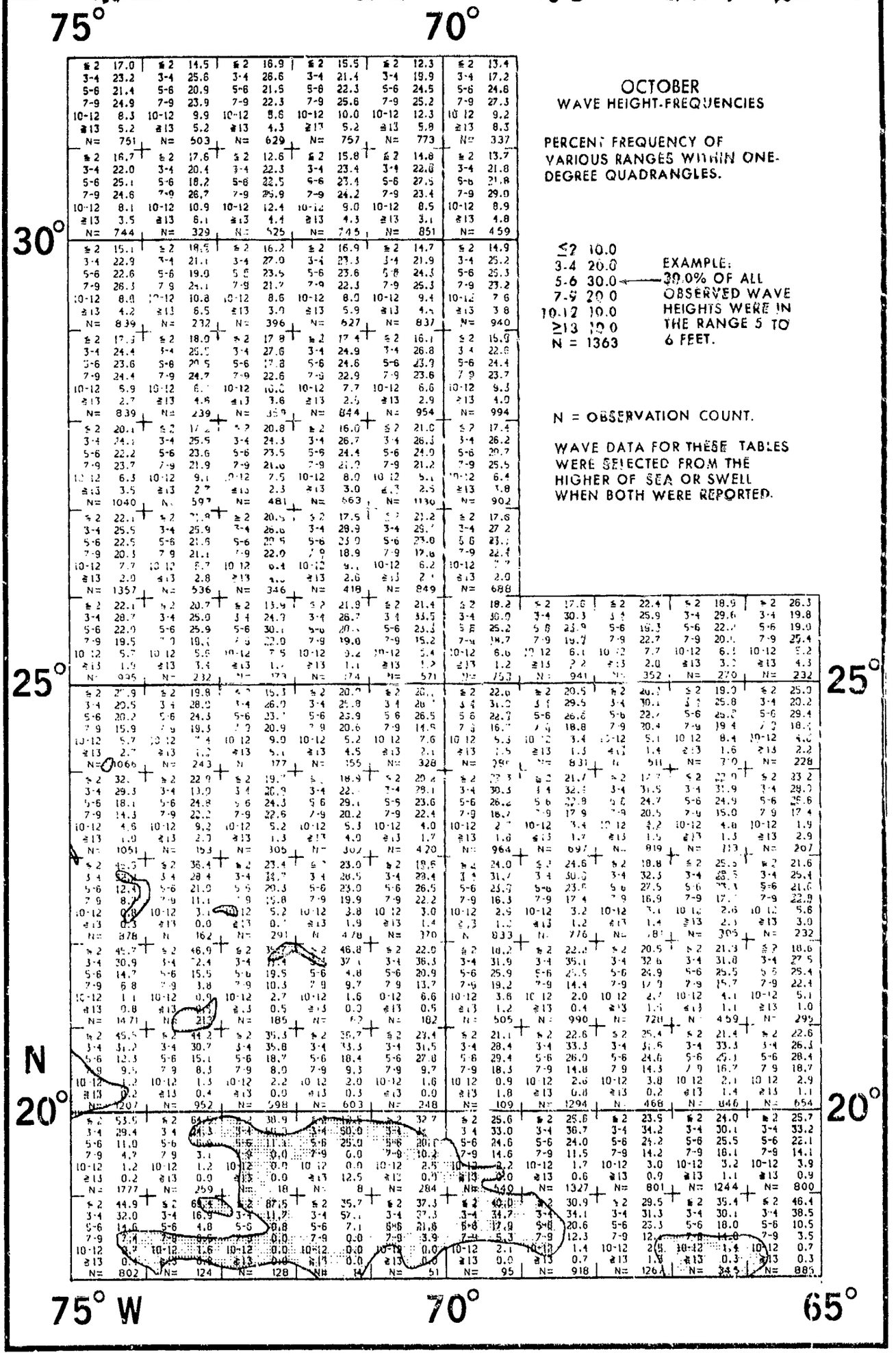
OCTOBER
WAVE HEIGHT-FREQUENCIES

PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

≤2 10.0
3-4 20.0
5-6 30.0 ← EXAMPLE: 30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.
7-9 20.0
10-12 10.0
≥13 10.0
N = 1363

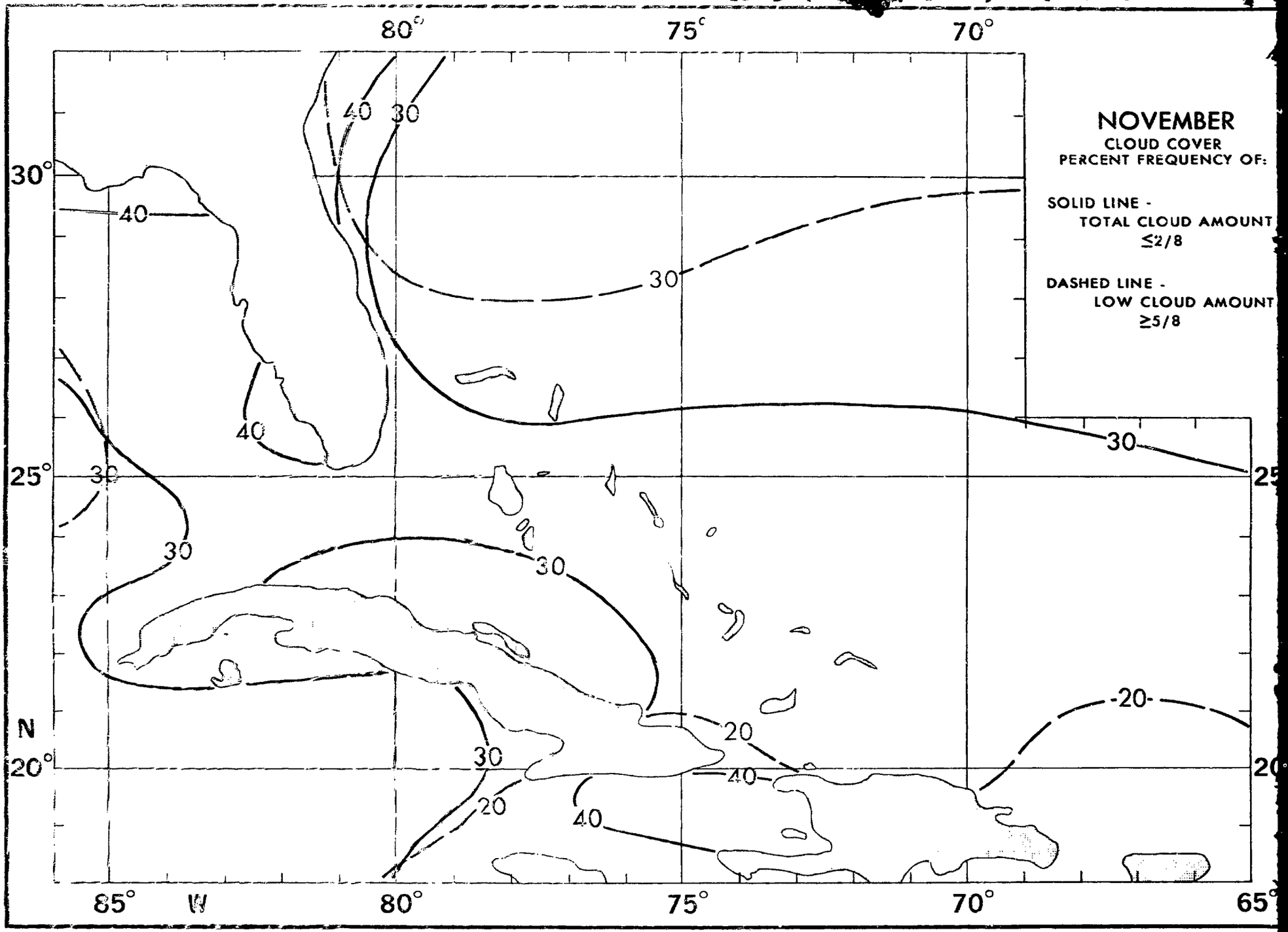
N = OBSERVATION COUNT.

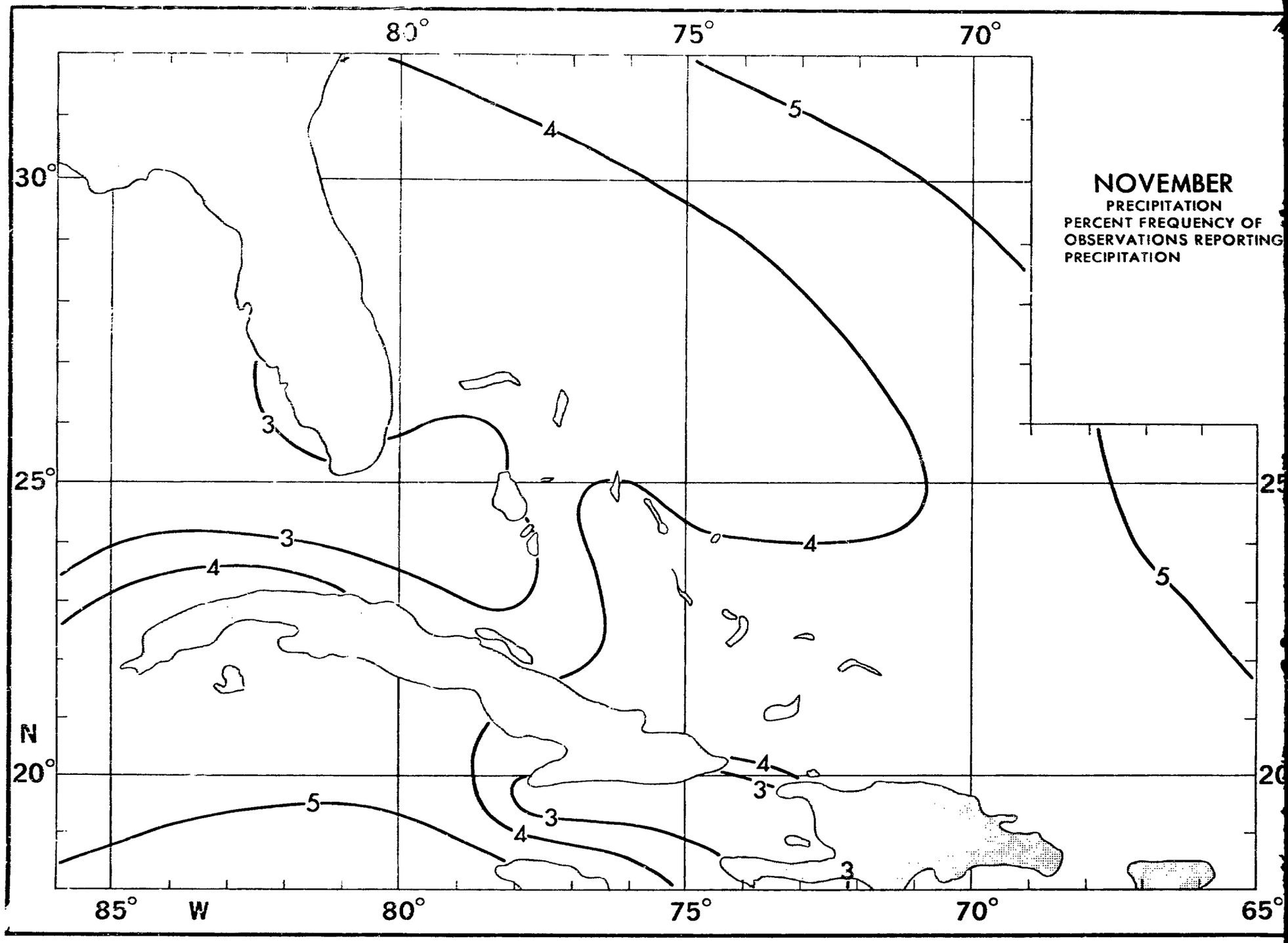
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

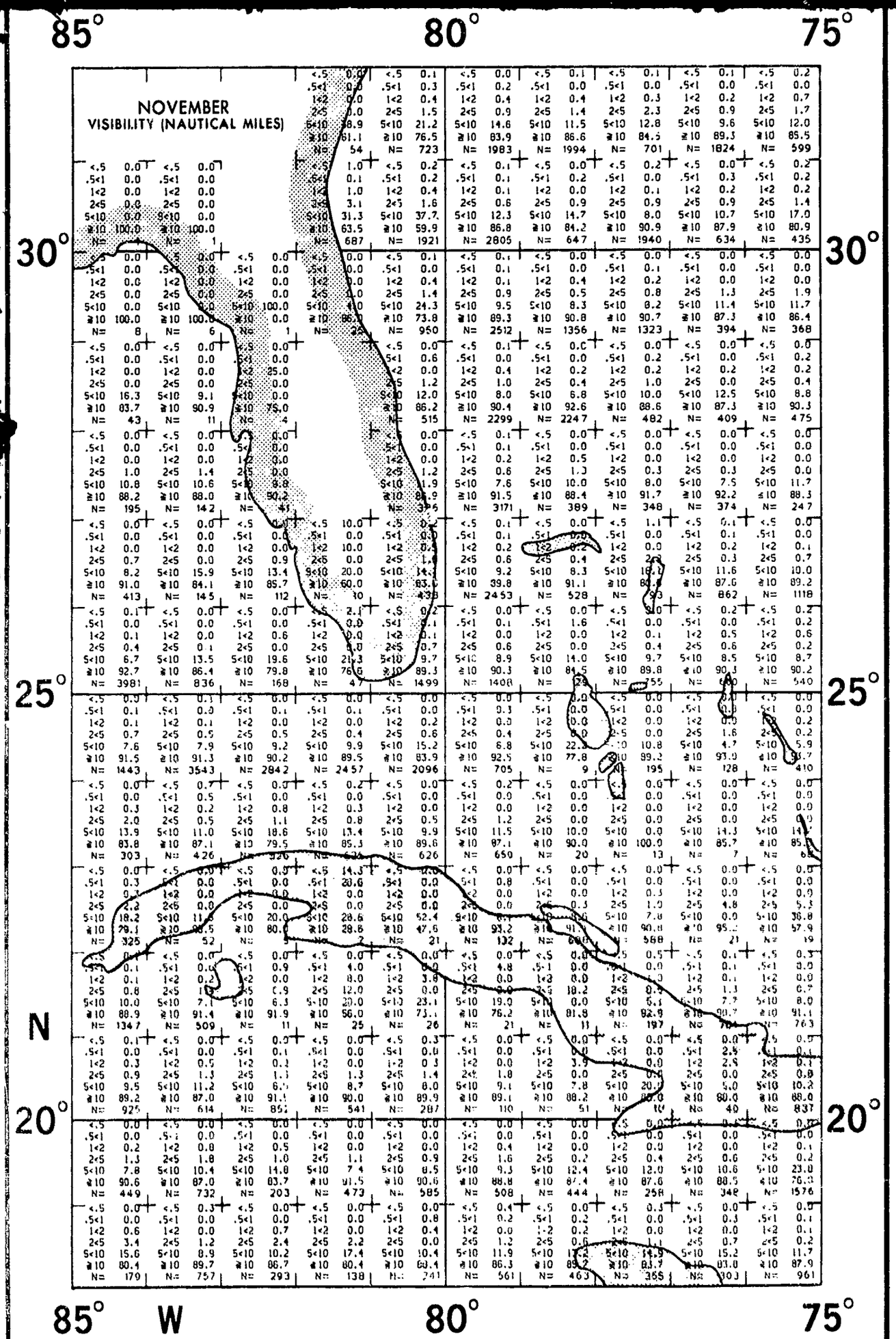


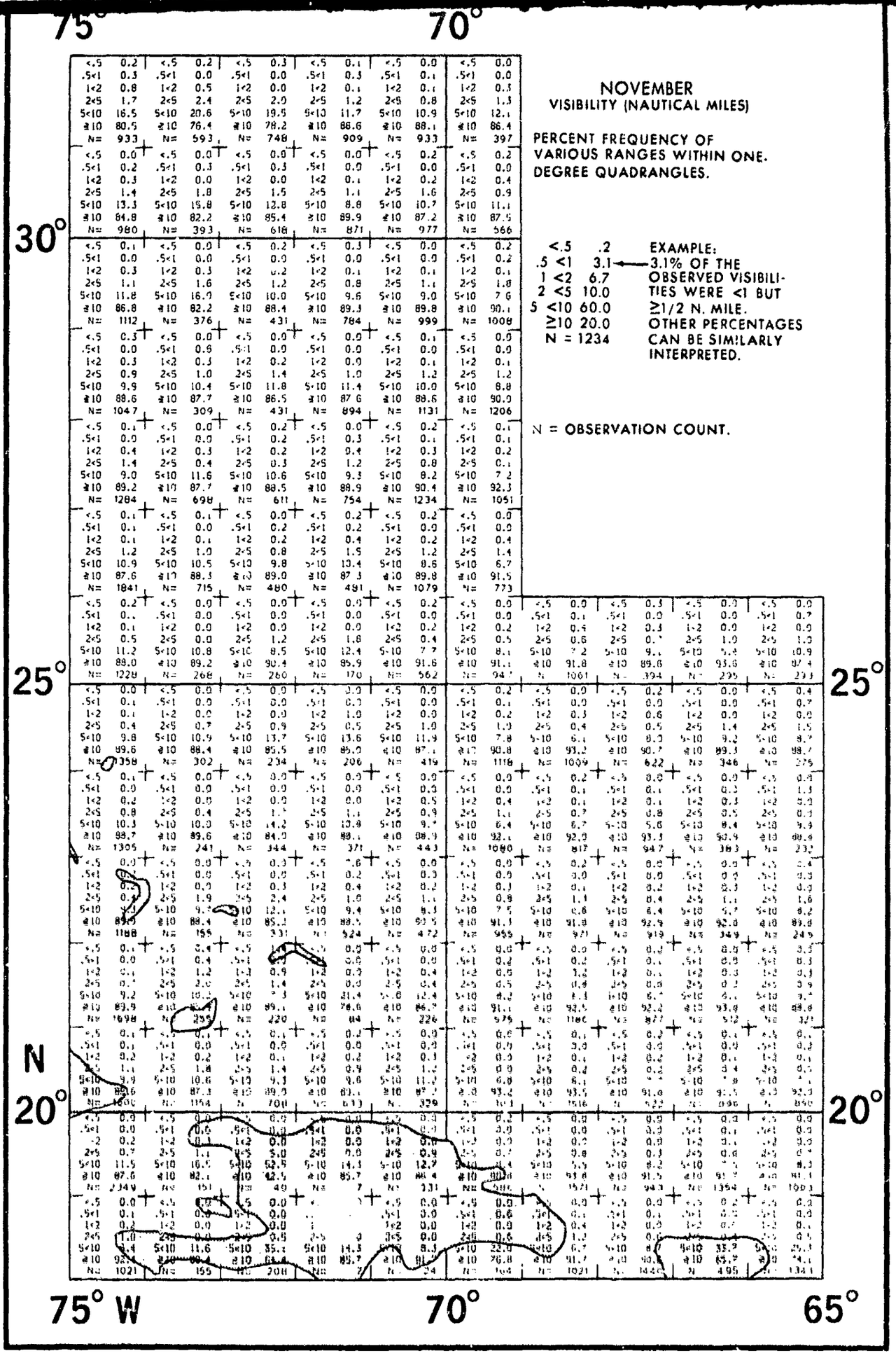
≤2	17.0	≤2	14.5	≤2	16.9	≤2	15.5	≤2	12.3	≤2	13.4
3-4	23.2	3-4	25.6	3-4	26.6	3-4	21.4	3-4	19.9	3-4	17.2
5-6	21.4	5-6	20.9	5-6	21.5	5-6	22.3	5-6	24.5	5-6	24.6
7-9	24.9	7-9	23.9	7-9	22.3	7-9	25.6	7-9	25.2	7-9	27.3
10-12	8.3	10-12	9.9	10-12	8.6	10-12	10.0	10-12	12.3	10-12	9.2
≥13	5.2	≥13	5.2	≥13	4.3	≥13	5.2	≥13	5.8	≥13	8.3
N=	751	N=	503	N=	629	N=	757	N=	773	N=	337
≤2	16.7	≤2	17.6	≤2	12.6	≤2	15.8	≤2	14.8	≤2	13.7
3-4	22.0	3-4	20.4	3-4	22.3	3-4	23.4	3-4	22.8	3-4	21.8
5-6	25.1	5-6	18.2	5-6	22.5	5-6	23.4	5-6	27.5	5-6	21.8
7-9	24.6	7-9	26.7	7-9	25.9	7-9	24.2	7-9	23.4	7-9	29.0
10-12	8.1	10-12	10.9	10-12	12.4	10-12	9.0	10-12	8.5	10-12	8.9
≥13	3.5	≥13	6.1	≥13	4.4	≥13	4.3	≥13	3.1	≥13	4.8
N=	744	N=	329	N=	525	N=	745	N=	851	N=	459
≤2	15.1	≤2	18.5	≤2	16.2	≤2	16.9	≤2	14.7	≤2	14.9
3-4	22.9	3-4	21.1	3-4	27.0	3-4	23.3	3-4	21.9	3-4	25.2
5-6	22.6	5-6	19.0	5-6	23.5	5-6	23.6	5-6	24.3	5-6	25.3
7-9	26.3	7-9	24.1	7-9	21.7	7-9	22.3	7-9	25.3	7-9	23.2
10-12	8.0	10-12	10.8	10-12	8.6	10-12	8.0	10-12	9.4	10-12	7.6
≥13	4.2	≥13	6.5	≥13	3.0	≥13	5.9	≥13	4.4	≥13	3.8
N=	839	N=	232	N=	396	N=	627	N=	837	N=	940
≤2	17.3	≤2	18.0	≤2	17.8	≤2	17.4	≤2	16.1	≤2	15.0
3-4	24.4	3-4	25.0	3-4	27.6	3-4	24.9	3-4	26.8	3-4	22.6
5-6	23.6	5-6	20.5	5-6	17.8	5-6	24.6	5-6	23.9	5-6	24.4
7-9	24.4	7-9	24.7	7-9	22.6	7-9	22.9	7-9	23.6	7-9	23.7
10-12	6.9	10-12	6.1	10-12	10.0	10-12	7.7	10-12	6.6	10-12	9.3
≥13	2.7	≥13	4.6	≥13	3.6	≥13	2.5	≥13	2.9	≥13	4.0
N=	839	N=	239	N=	389	N=	844	N=	954	N=	994
≤2	20.1	≤2	17.2	≤2	20.8	≤2	16.0	≤2	21.0	≤2	17.4
3-4	24.1	3-4	25.5	3-4	24.3	3-4	26.7	3-4	26.3	3-4	26.2
5-6	22.2	5-6	23.6	5-6	23.5	5-6	24.4	5-6	24.0	5-6	20.7
7-9	23.7	7-9	21.9	7-9	21.0	7-9	21.9	7-9	21.2	7-9	25.5
10-12	6.3	10-12	9.1	10-12	7.5	10-12	8.0	10-12	5.1	10-12	6.4
≥13	3.5	≥13	2.7	≥13	2.3	≥13	3.0	≥13	2.5	≥13	1.8
N=	1040	N=	597	N=	481	N=	863	N=	1130	N=	902
≤2	22.1	≤2	21.9	≤2	20.5	≤2	17.5	≤2	21.2	≤2	17.6
3-4	25.5	3-4	25.9	3-4	26.0	3-4	28.9	3-4	28.7	3-4	27.2
5-6	22.5	5-6	21.6	5-6	20.5	5-6	23.0	5-6	23.0	5-6	23.1
7-9	20.3	7-9	21.1	7-9	22.0	7-9	18.9	7-9	17.6	7-9	22.4
10-12	7.7	10-12	8.7	10-12	6.4	10-12	9.1	10-12	6.2	10-12	7.9
≥13	2.0	≥13	2.8	≥13	3.0	≥13	2.6	≥13	2.1	≥13	2.0
N=	1357	N=	536	N=	346	N=	418	N=	849	N=	688
≤2	22.1	≤2	20.7	≤2	13.9	≤2	21.9	≤2	21.4	≤2	18.2
3-4	28.7	3-4	25.0	3-4	24.3	3-4	26.7	3-4	33.5	3-4	30.0
5-6	22.0	5-6	25.9	5-6	30.1	5-6	20.1	5-6	23.3	5-6	25.2
7-9	19.5	7-9	19.1	7-9	22.0	7-9	19.0	7-9	15.2	7-9	19.7
10-12	5.7	10-12	5.6	10-12	7.5	10-12	9.2	10-12	5.4	10-12	6.6
≥13	1.9	≥13	3.4	≥13	1.7	≥13	1.1	≥13	1.1	≥13	1.2
N=	995	N=	232	N=	173	N=	274	N=	571	N=	753
≤2	27.9	≤2	19.8	≤2	15.3	≤2	20.9	≤2	20.1	≤2	22.0
3-4	20.5	3-4	28.0	3-4	26.0	3-4	25.8	3-4	28.1	3-4	31.0
5-6	20.2	5-6	24.3	5-6	23.1	5-6	23.9	5-6	26.5	5-6	22.2
7-9	15.9	7-9	19.3	7-9	20.9	7-9	20.6	7-9	14.9	7-9	16.7
10-12	5.7	10-12	7.4	10-12	9.0	10-12	5.2	10-12	7.6	10-12	5.3
≥13	2.7	≥13	1.2	≥13	5.1	≥13	4.5	≥13	2.1	≥13	1.5
N=	1066	N=	243	N=	177	N=	155	N=	328	N=	299
≤2	32.1	≤2	22.9	≤2	19.7	≤2	18.9	≤2	20.4	≤2	22.3
3-4	29.3	3-4	13.0	3-4	20.9	3-4	22.1	3-4	28.1	3-4	30.3
5-6	18.1	5-6	24.8	5-6	24.3	5-6	29.1	5-6	23.6	5-6	26.2
7-9	14.3	7-9	22.2	7-9	22.6	7-9	20.2	7-9	22.4	7-9	16.2
10-12	4.6	10-12	9.2	10-12	5.2	10-12	5.3	10-12	4.0	10-12	2.7
≥13	1.0	≥13	2.0	≥13	1.3	≥13	4.0	≥13	1.7	≥13	1.6
N=	1051	N=	153	N=	305	N=	307	N=	420	N=	964
≤2	45.3	≤2	38.4	≤2	23.4	≤2	23.0	≤2	18.6	≤2	24.0
3-4	32.4	3-4	28.4	3-4	33.7	3-4	28.5	3-4	29.4	3-4	31.7
5-6	12.4	5-6	21.0	5-6	20.3	5-6	23.0	5-6	26.5	5-6	23.9
7-9	8.2	7-9	11.1	7-9	15.8	7-9	19.9	7-9	22.2	7-9	16.3
10-12	0.8	10-12	3.1	10-12	5.2	10-12	3.8	10-12	3.0	10-12	2.9
≥13	0.3	≥13	0.0	≥13	0.1	≥13	1.9	≥13	1.4	≥13	1.2
N=	878	N=	162	N=	291	N=	478	N=	370	N=	833
≤2	45.7	≤2	46.9	≤2	35.3	≤2	46.8	≤2	22.0	≤2	18.2
3-4	30.9	3-4	32.4	3-4	37.1	3-4	37.1	3-4	36.3	3-4	31.9
5-6	14.7	5-6	15.5	5-6	19.5	5-6	4.8	5-6	20.9	5-6	25.9
7-9	6.8	7-9	3.8	7-9	10.3	7-9	9.7	7-9	13.7	7-9	19.2
10-12	1.1	10-12	0.9	10-12	2.7	10-12	1.6	10-12	6.6	10-12	3.8
≥13	0.8	≥13	0.1	≥13	0.5	≥13	0.0	≥13	0.5	≥13	1.2
N=	1471	N=	217	N=	185	N=	69	N=	182	N=	505
≤2	49.5	≤2	44.2	≤2	35.3	≤2	36.7	≤2	23.4	≤2	21.1
3-4	31.2	3-4	30.7	3-4	35.8	3-4	33.3	3-4	31.5	3-4	28.4
5-6	12.3	5-6	15.1	5-6	18.7	5-6	18.4	5-6	27.8	5-6	29.4
7-9	9.5	7-9	8.3	7-9	8.0	7-9	9.3	7-9	9.7	7-9	18.3
10-12	1.2	10-12	1.3	10-12	2.2	10-12	2.0	10-12	1.6	10-12	0.9
≥13	0.2	≥13	0.4	≥13	0.0	≥13	0.3	≥13	0.0	≥13	1.8
N=	1207	N=	952	N=	598	N=	603	N=	248	N=	109
≤2	53.5	≤2	64.2	≤2	30.9	≤2	39.4	≤2	32.7	≤2	25.6
3-4	29.4	3-4	24.3	3-4	44.1	3-4	50.0	3-4	36.4	3-4	33.0
5-6	11.0	5-6	8.6	5-6	11.3	5-6	25.0	5-6	20.1	5-6	24.6
7-9	4.7	7-9	3.1	7-9	0.0	7-9	0.0	7-9	10.2	7-9	14.6
10-12	1.2	10-12	1.2	10-12	0.0	10-12	0.0	10-12	2.5	10-12	2.2
≥13	0.2	≥13	0.9	≥13	0.0	≥13	12.5	≥13	0.9	≥13	0.0
N=	1777	N=	269	N=	18	N=	8	N=	284	N=	440
≤2	44.9	≤2	66.4	≤2	87.5	≤2	35.7	≤2	37.3	≤2	40.0
3-4	32.0	3-4	16.9	3-4	11.7	3-4	57.1	3-4	37.3	3-4	34.7
5-6	14.6	5-6	4.8	5-6	0.8	5-6	7.1	5-6	21.8	5-6	17.0
7-9	7.4	7-9	8.6	7-9	0.0	7-9	0.0	7-9	3.9	7-9	5.3
10-12	0.7	10-12	1.6	10-12	0.0	10-12	0.0	10-12	0.0	10-12	2.1
≥13	0.4	≥13	0.3	≥13	0.0	≥13	0.0	≥13	0.0	≥13	0.0
N=	802	N=	124	N=	128	N=	14	N=	51	N=	95

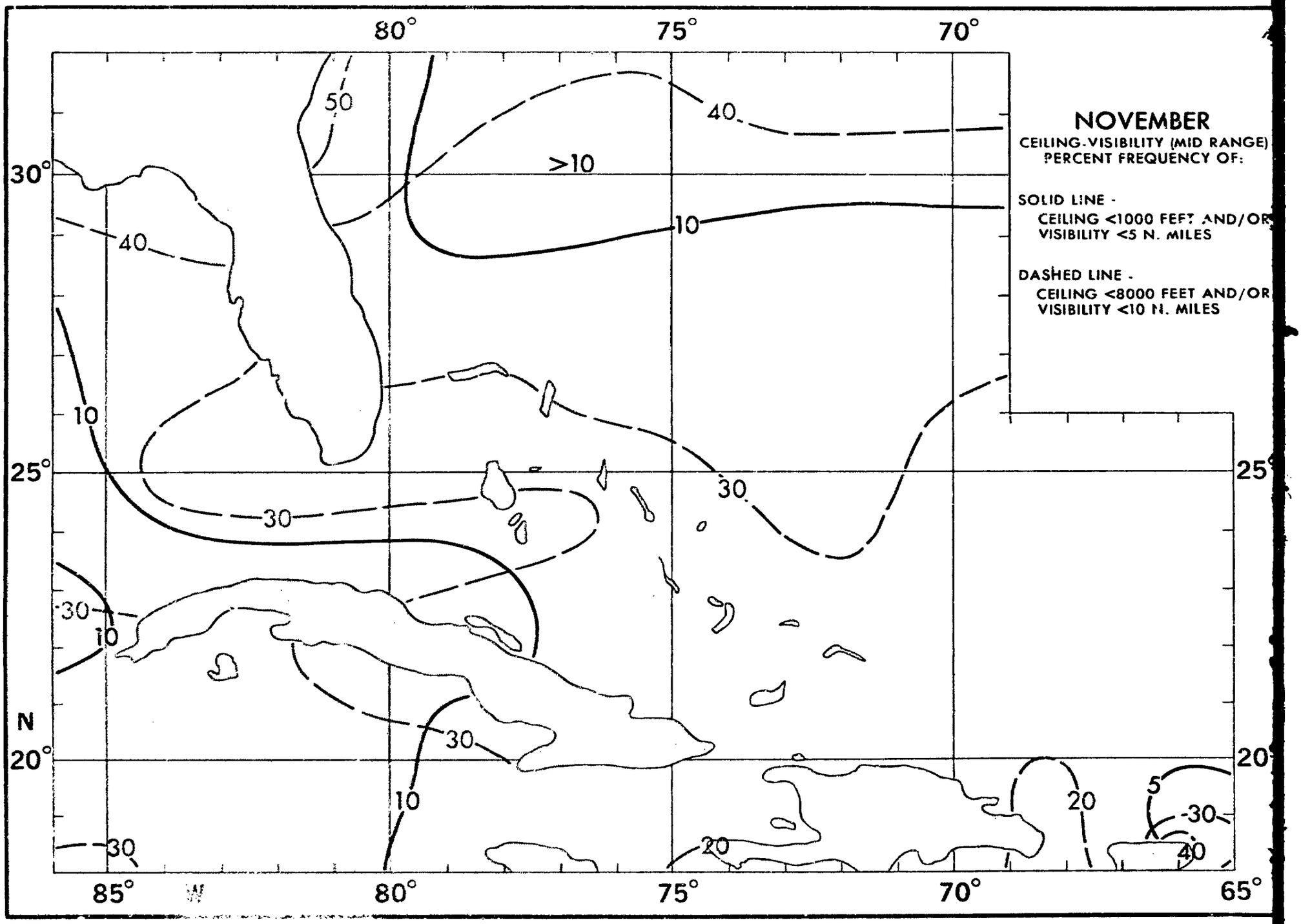
≤2	18.8	≤2	17.6	≤2	22.4	≤2	18.9	≤2	26.3		
3-4	30.0	3-4	30.3	3-4	25.9	3-4	29.6	3-4	19.8		
5-6	25.2	5-6	23.9	5-6	19.3	5-6	22.4	5-6	19.0		
7-9	19.7	7-9	19.9	7-9	22.7	7-9	20.1	7-9	25.4		
10-12	6.6	10-12	6.1	10-12	7.7	10-12	6.5	10-12	5.2		
≥13	1.2	≥13	2.2	≥13	2.0	≥13	3.2	≥13	4.3		
N=	753	N=	941	N=	352	N=	270	N=	232		
≤2	22.0	≤2	20.5	≤2	20.3	≤2	19.0	≤2	25.0		
3-4	31.0	3-4	29.5	3-4	30.1	3-4	25.8	3-4	20.2		
5-6	22.3	5-6	26.6	5-6	26.2	5-6	22.7	5-6	29.4		
7-9	16.7	7-9	18.8	7-9	20.4	7-9	19.4	7-9	18.4		
10-12	5.3	10-12	3.4	10-12	5.1	10-12	8.4	10-12	4.0		
≥13	1.5	≥13	1.3	≥13	1.4	≥13	1.6	≥13	2.2		
N=	299	N=	831	N=	911	N=	370	N=	228		
≤2	22.3	≤2	21.7	≤2	17.7	≤2	22.0	≤2	23.2		
3-4	30.3	3-4	32.5	3-4	31.5	3-4	31.9	3-4	29.0		
5-6	26.2	5-6	22.9	5-6	24.7	5-6	24.9	5-6	25.6		
7-9	16.2	7-9	17.9	7-9	20.5	7-9	15.0	7-9	17.4		
10-12	2.7	10-12	3.4	10-12	4.2	10-12	4.8	10-12	1.9		
≥13	1.6	≥13	1.7	≥13	1.5	≥13	1.3	≥13	2.9		
N=	964	N=	697	N=	919	N=	313	N=	307		
≤2	24.0	≤2	24.6	≤2	18.8	≤2	25.5	≤2	21.6		
3-4	31.7	3-4	30.0	3-4	32.3	3-4	28.5	3-4	25.4		
5-6	23.9	5-6	23.8	5-6	27.5	5-6	29.1	5-6	21.6		
7-9	16.3	7-9	17.4	7-9	16.9	7-9	17.1	7-9	22.8		
10-12	2.9	10-12	3.2	10-12	3.1	10-12	2.6	10-12	5.8		
≥13	1.6	≥13	1.2	≥13	1.4	≥13	2.1	≥13	3.0		
N=	833	N=	776	N=	681	N=	305	N=	232		
≤2	18.2	≤2	22.8	≤2	20.5	≤2	21.3	≤2	18.6		
3-4	31.9	3-4	35.1	3-4	32.6	3-4	31.8	3-4	27.5		
5-6	25.9	5-6	25.5	5-6	24.9	5-6	25.5	5-6	28.4		
7-9	19.2	7-9	14.4	7-9	17.9	7-9	15.7	7-9	22.4		
10-12	3.8	10-12	2.0	10-12	4.7	10-12	4.1	10-12	5.1		
≥13	1.2	≥13	0.4	≥13	1.5	≥13	1.1	≥13	1.0		
N=	505	N=	990	N=	728	N=	459	N=	295		
≤2	21.1	≤2	22.6	≤2	25.4	≤2	21.4	≤2	22.6		
3-4	28.4	3-4	33.3	3-4	31.6	3-4	33.3	3-4	26.3		
5-6	29.4	5-6	26.0	5-6	24.6	5-6	25.1	5-6	28.4		
7-9	18.3	7-9	14.8	7-9	14.3	7-9	16.7	7-9	18.7		
10-12	0.9	10-12	2.6	10-12	3.8	10-12	2.1	10-12	2.9		
≥13	1.8	≥13	0.8	≥13	0.2	≥13	1.4	≥13	1.1		
N=	109	N=	1294	N=	468	N=	846	N=	654		
≤2	25.6	≤2	26.8	≤2	23.5	≤2	24.0	≤2	25.7		
3-4	33.0	3-4	36.7	3-4	34.2	3-4	30.1	3-4	33.2		
5-6	24.6	5-6	24.0	5-6	24.2	5-6	25.5	5-6	22.1		
7-9	14.6	7-9	11.5	7-9	14.2	7-9	16.1	7-9	14.1		
10-12	2.2	10-12	1.7	10-12	3.0	10-12	3.2	10-12	3.9		
≥13	0.0	≥13	0.6	≥13	0.9	≥13	1.1	≥13	0.9		
N=	1327	N=	801	N=	1244	N=	800				
≤2	40.0	≤2	30.9	≤2	29.5	≤2	35.4	≤2	46.4		
3-4	34.7	3-4	34.1	3-4	31.3	3-4	30.4	3-4	38.5		
5-6	17.0	5-6	20.6	5-6	23.3	5-6	18.0	5-6	10.5		
7-9	5.3	7-9	12.3	7-9	12.[illegible]	7-9	14.0	7-9	3.5		
10-12	2.1	10-12	1.4	10-12	2.[illegible]	10-12	1.4	10-12	0.7		
≥13	0.0	≥13	0.7	≥13	1.[illegible]	≥13	0.3	≥13	0.3		
N=	95	N=	918	N=	126[illegible]	N=	34[illegible]	N=	885		

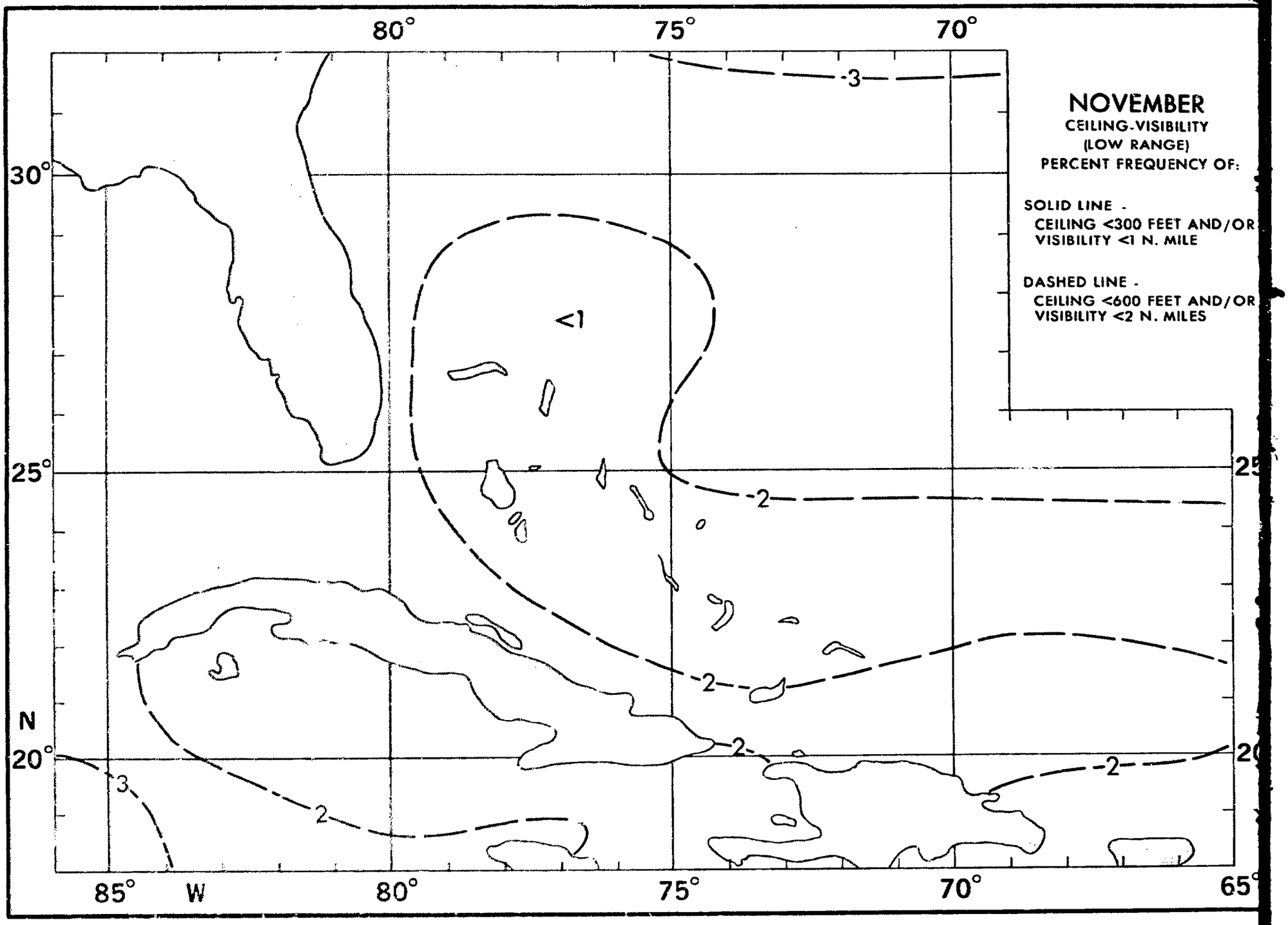

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
NOVEMBER
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/8
40
30
40
30
30
40
30
30
30
20
30
20
40
20
40
30
30
25
25
20
20

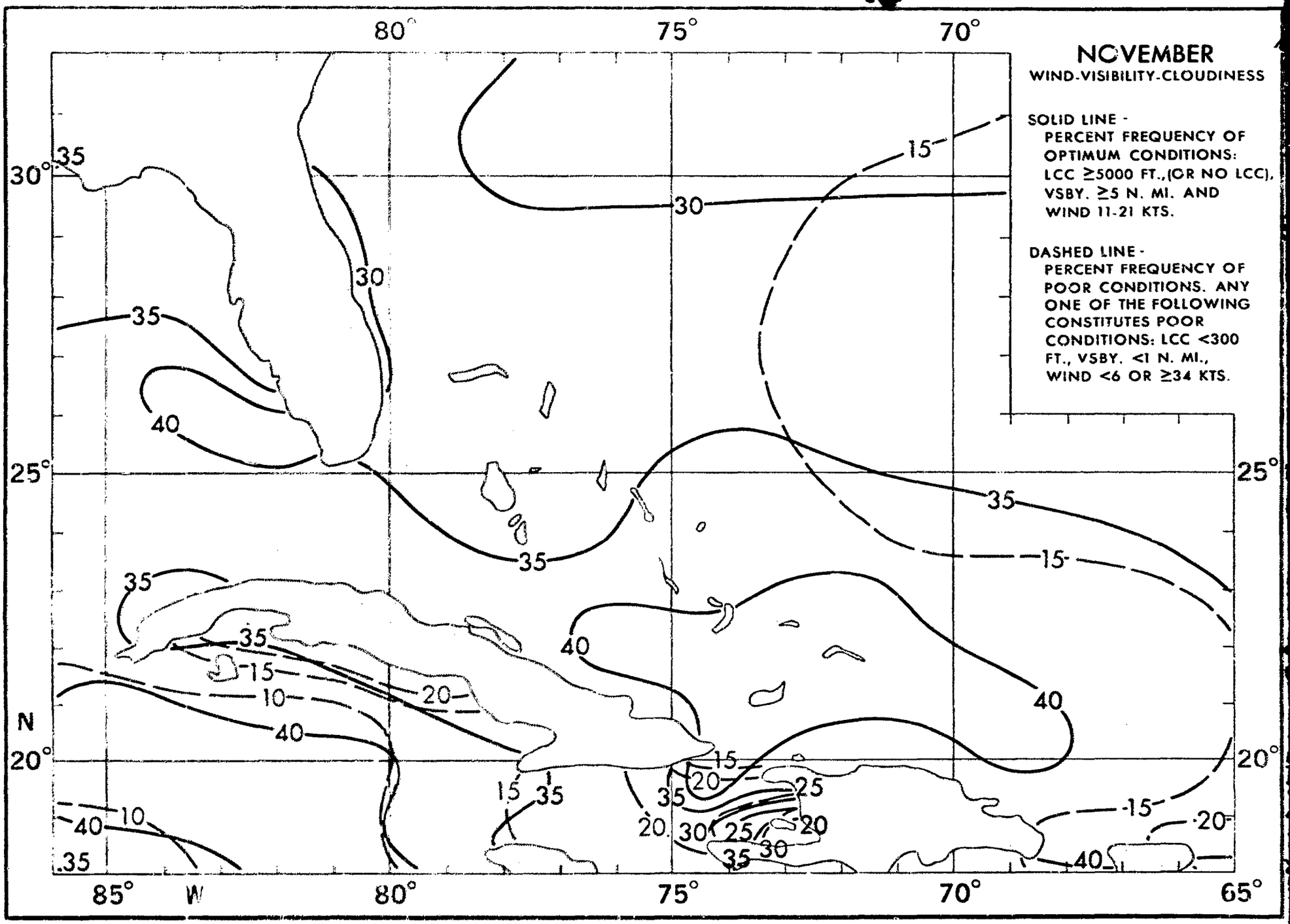

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
3
4
5
NOVEMBER
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION

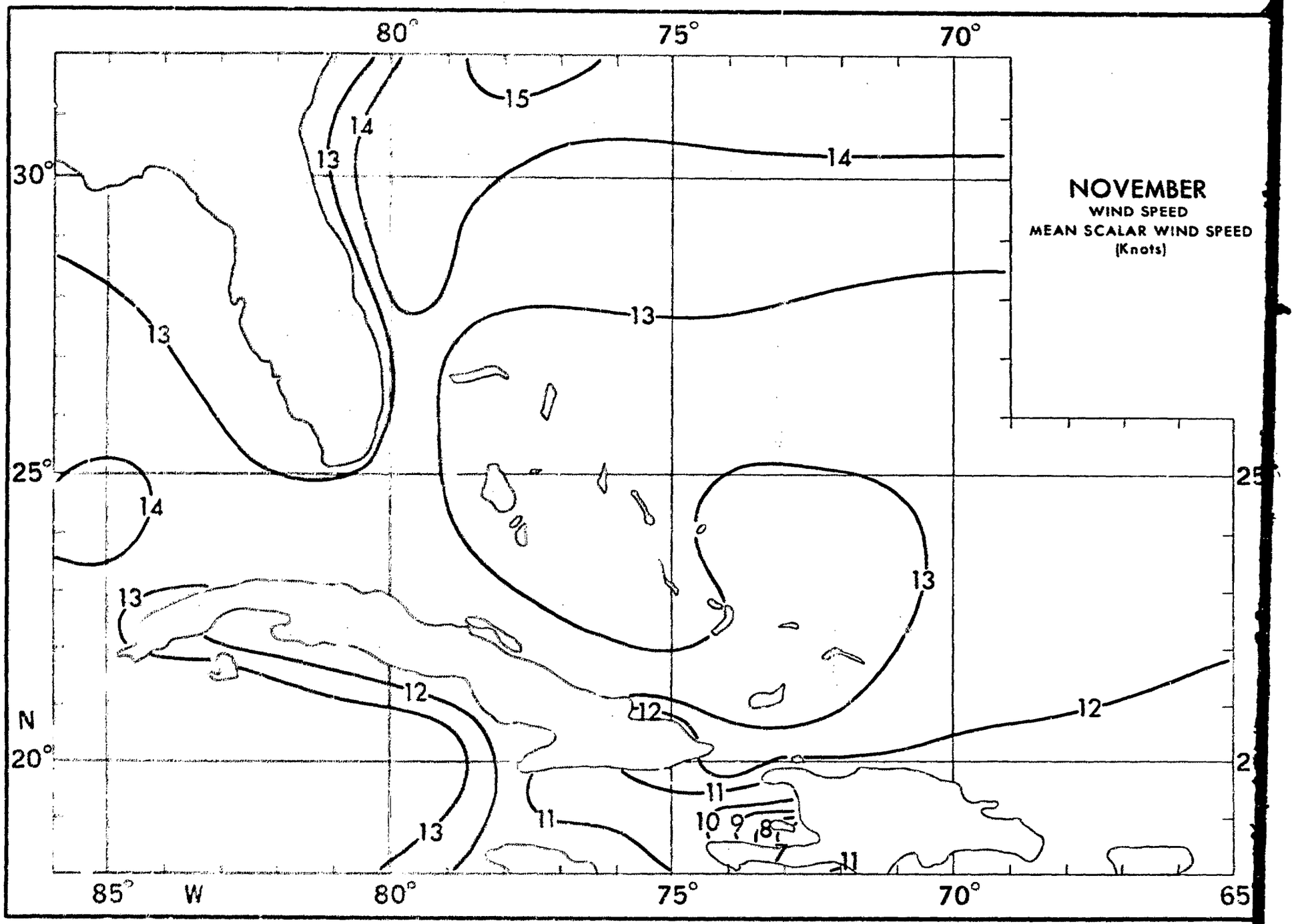

NOVEMBER
VISIBILITY (NAUTICAL MILES)
85°
80°
75°
30°
25°
20°
N
W

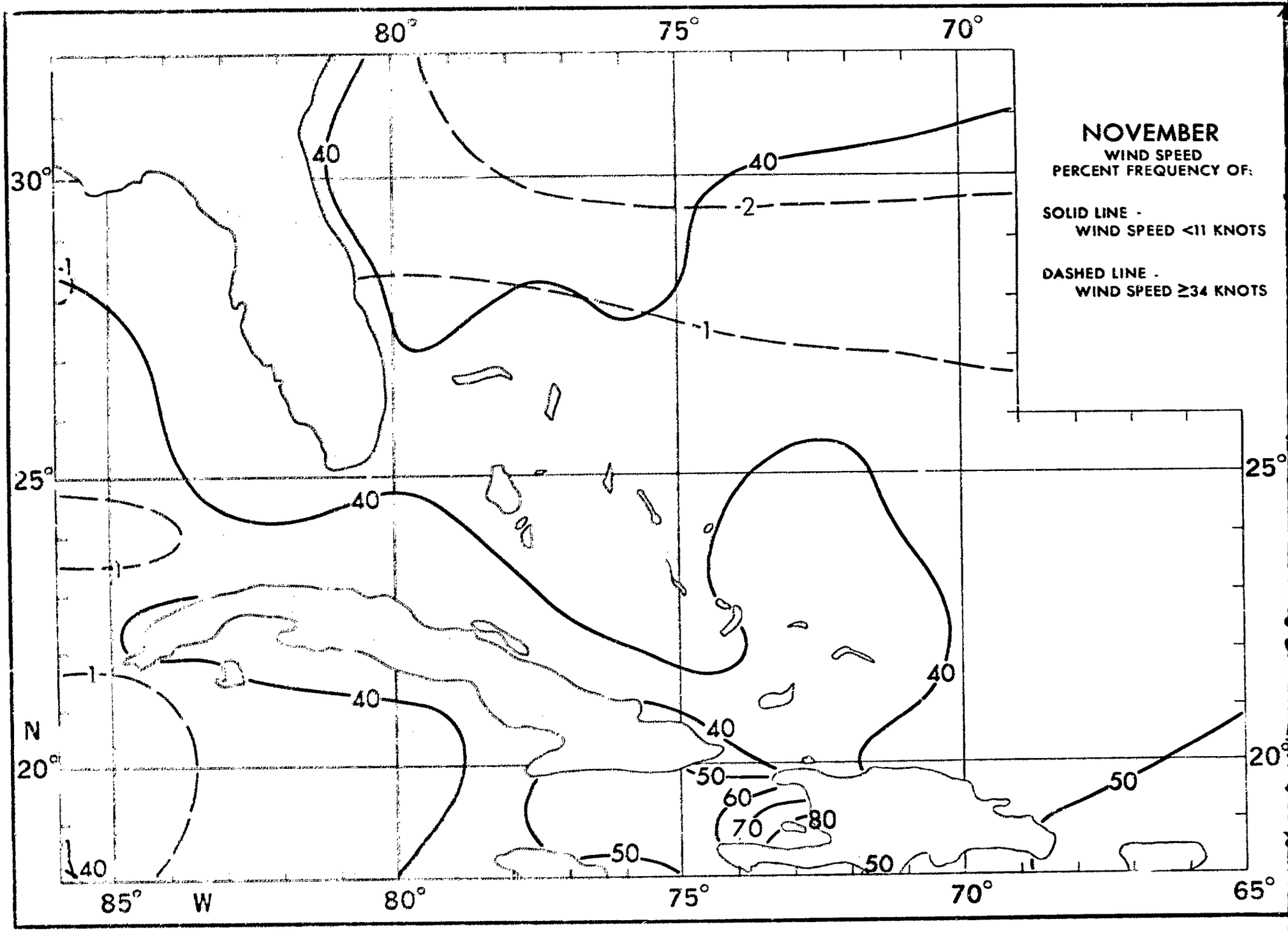

75°
70°
30°
25°
N
20°
75° W
70°
65°
NOVEMBER
VISIBILITY (NAUTICAL MILES)
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE. DEGREE QUADRANGLES.
<.5 .2
.5 <1 3.1
1 <2 6.7
2 <5 10.0
5 <10 60.0
≥10 20.0
N = 1234
EXAMPLE:
3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE.
OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.
N = OBSERVATION COUNT.

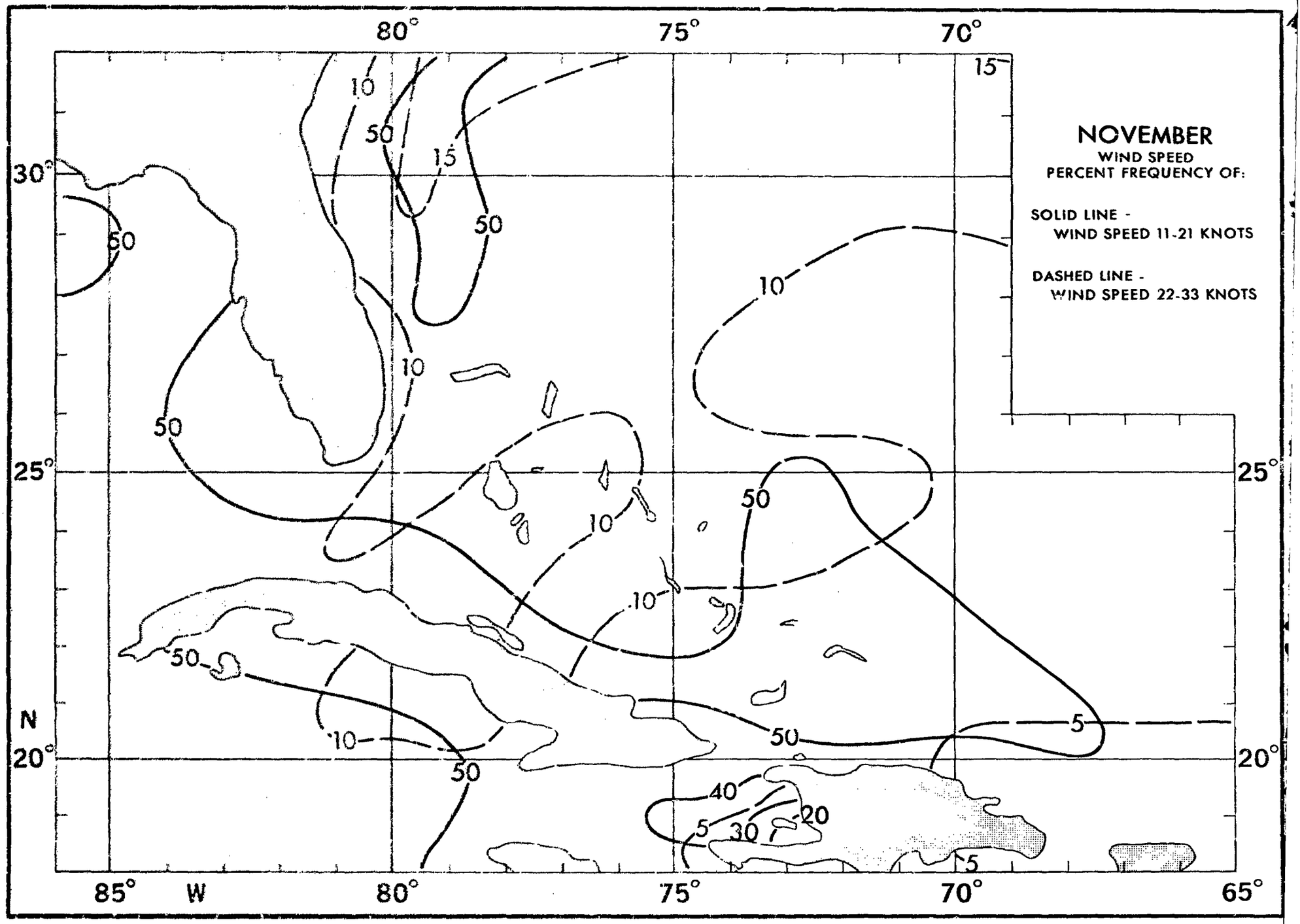

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
50
40
>10
10
40
10
30
30
30
10
30
10
30
20
20
5
30
40
NOVEMBER
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES

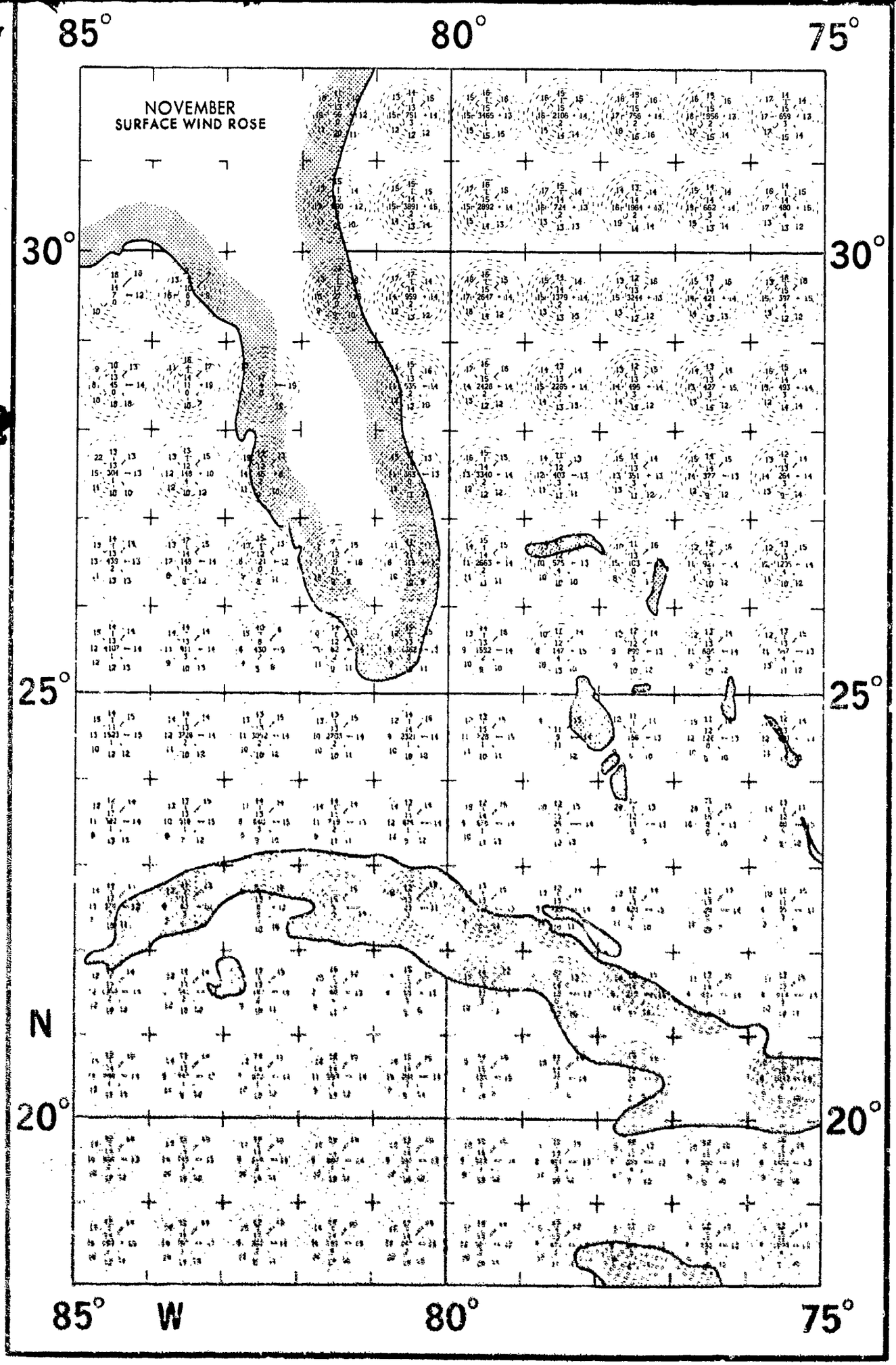

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
NOVEMBER
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/OR
VISIBILITY <1 N. MILE
DASHED LINE -
CEILING <600 FEET AND/OR
VISIBILITY <2 N. MILES
<1
2
3

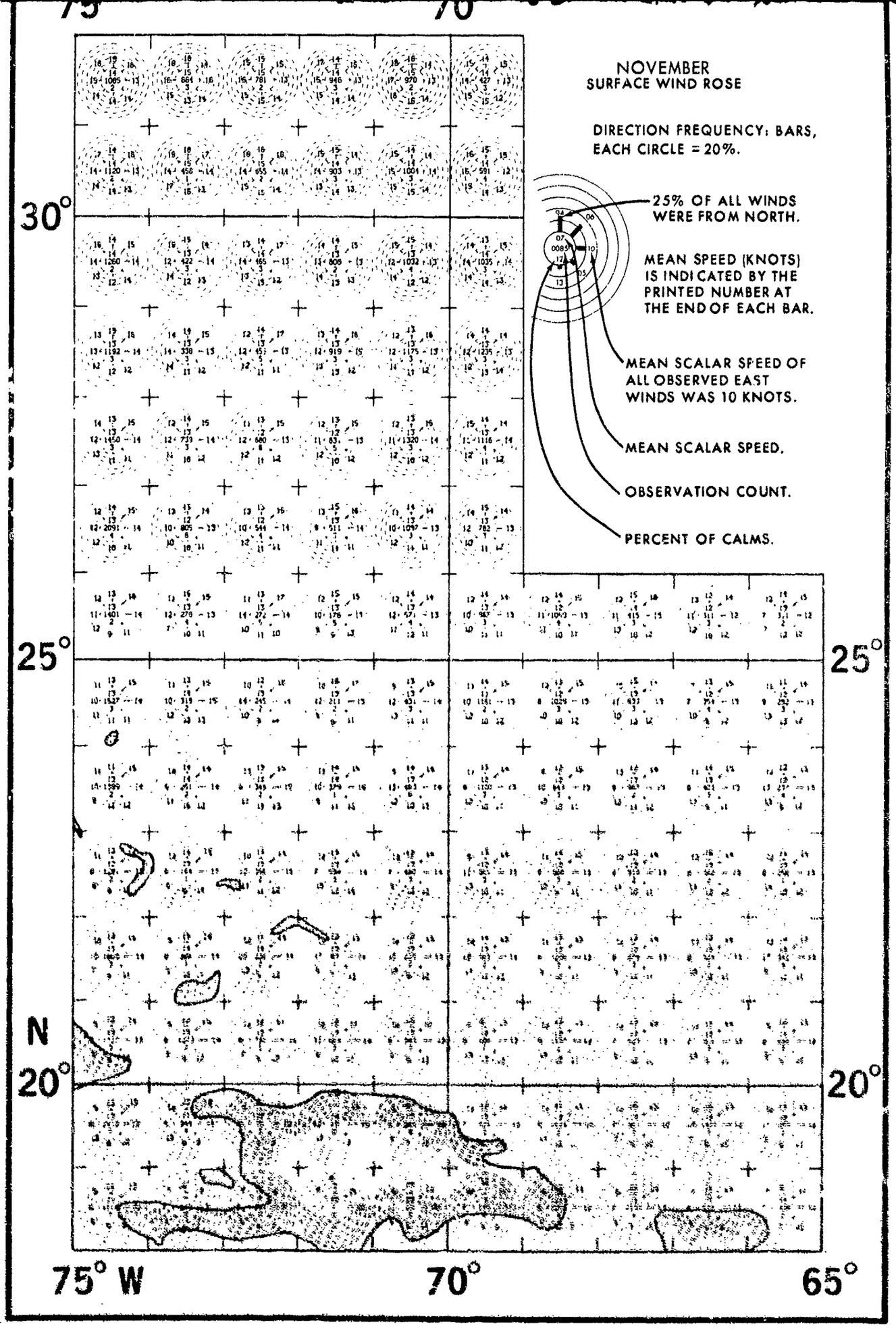

NOVEMBER
WIND-VISIBILITY-CLOUDINESS
SOLID LINE -
PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE -
PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
80°
75°
70°
30°
25°
N
20°
85°
W
80°
75°
70°
65°

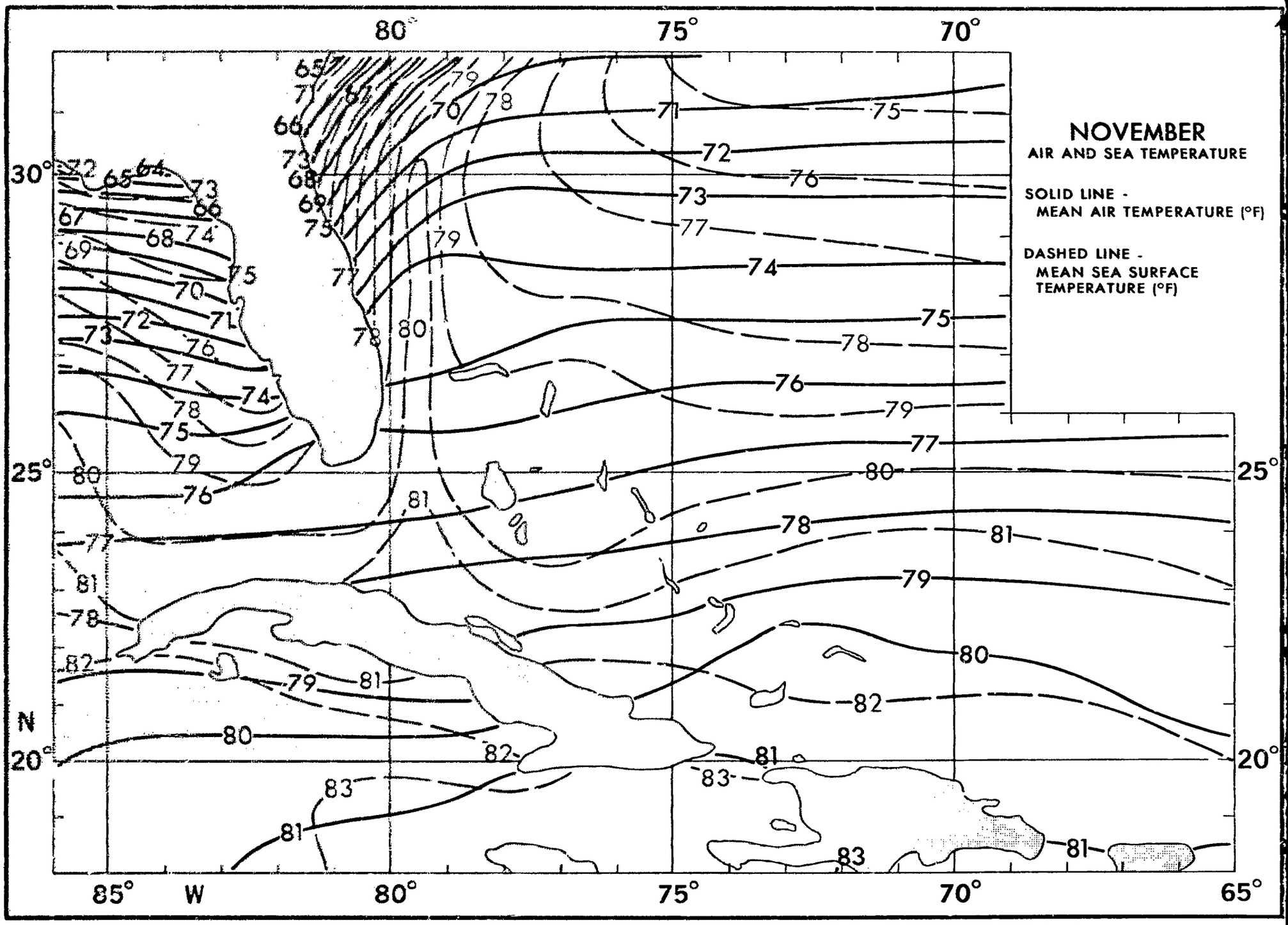

80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65
15
14
13
14
13
13
14
13
12
12
12
11
11
10
9
8
11
NOVEMBER
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)

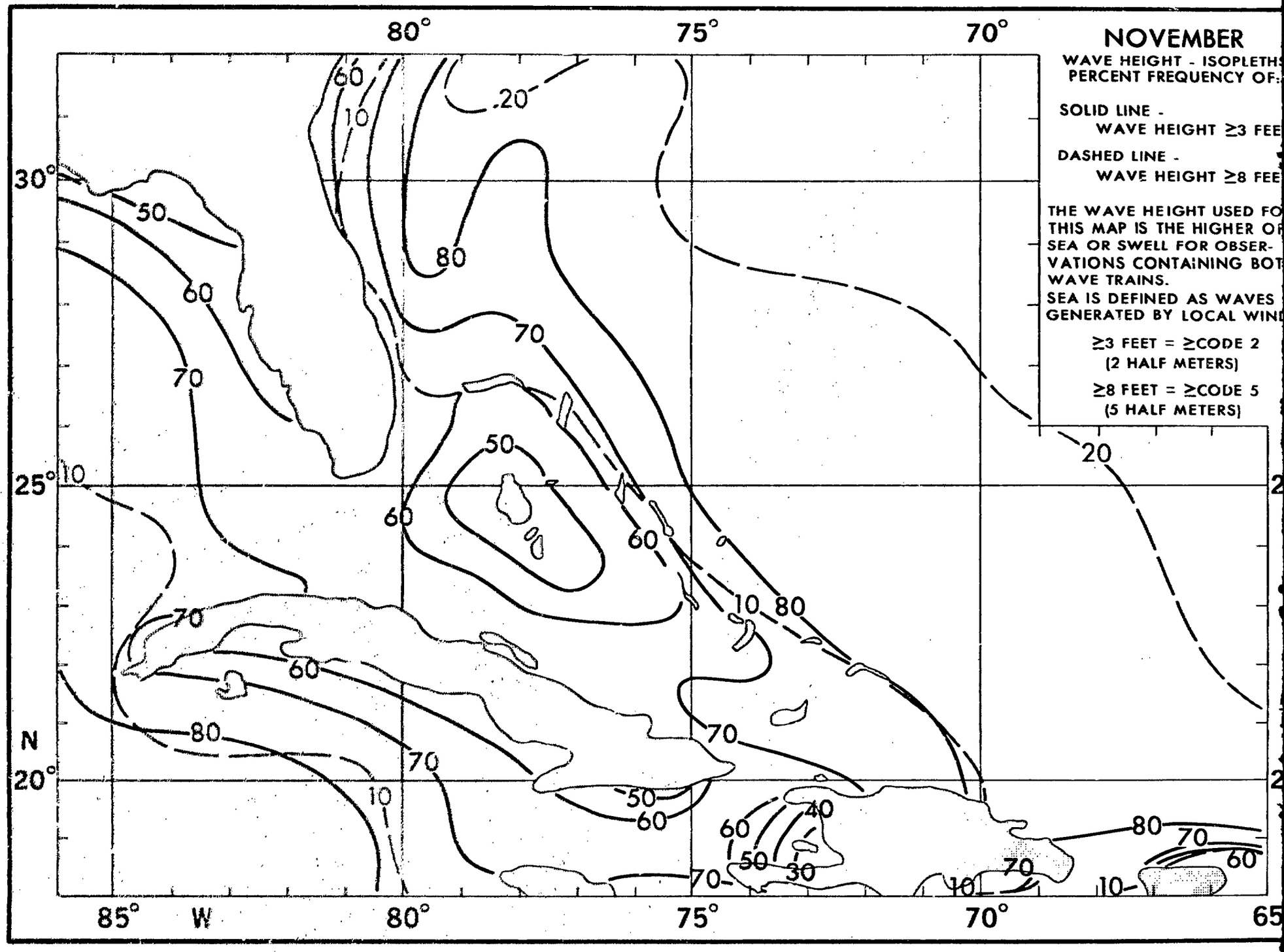

NOVEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS
80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°
40
2
1
50
60
70
80

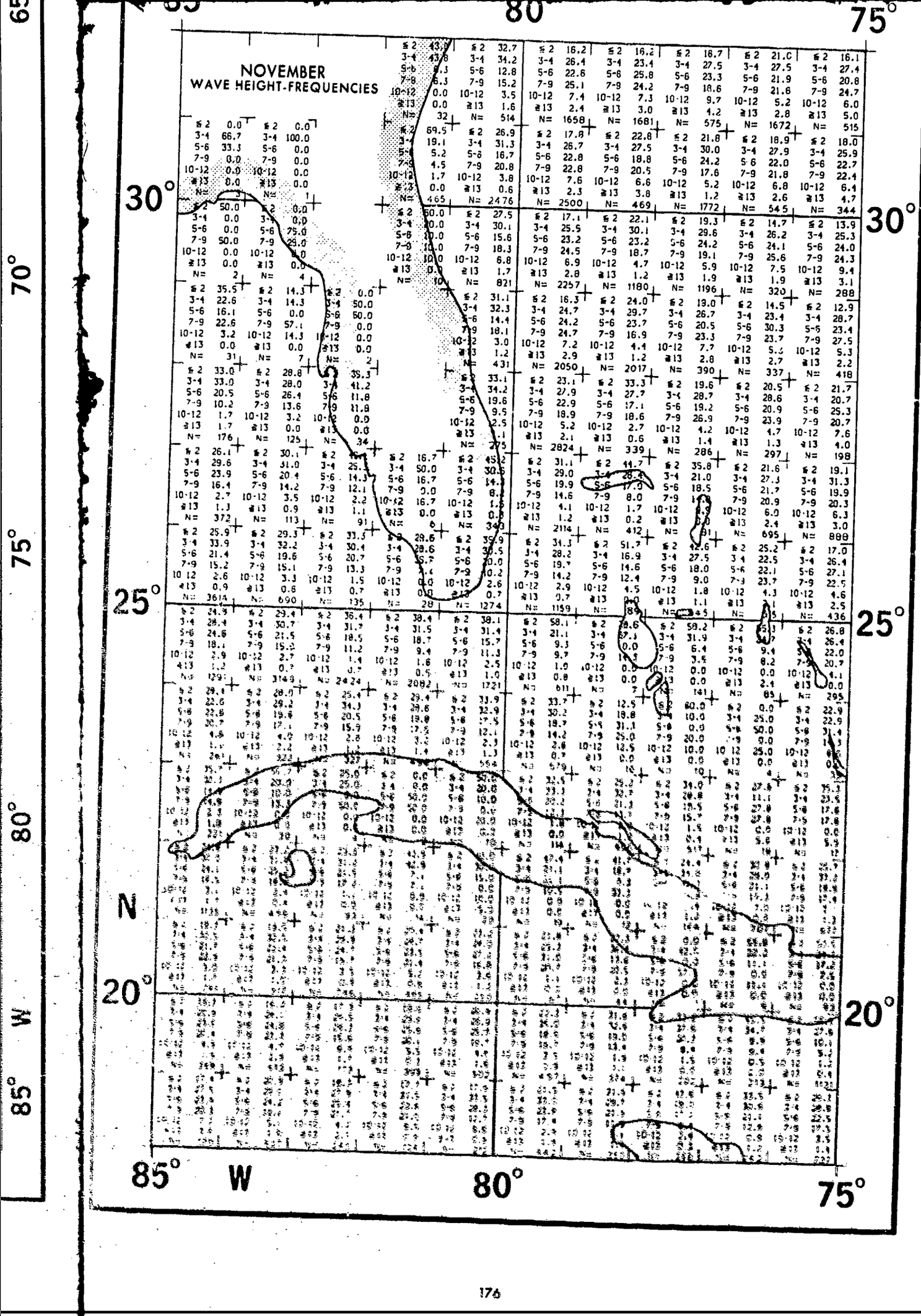

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
NOVEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED 11-21 KNOTS
DASHED LINE -
WIND SPEED 22-33 KNOTS
15
10
50
15
50
50
10
50
10
50
10
10
50
50
10
50
5
40
5
30
20
5

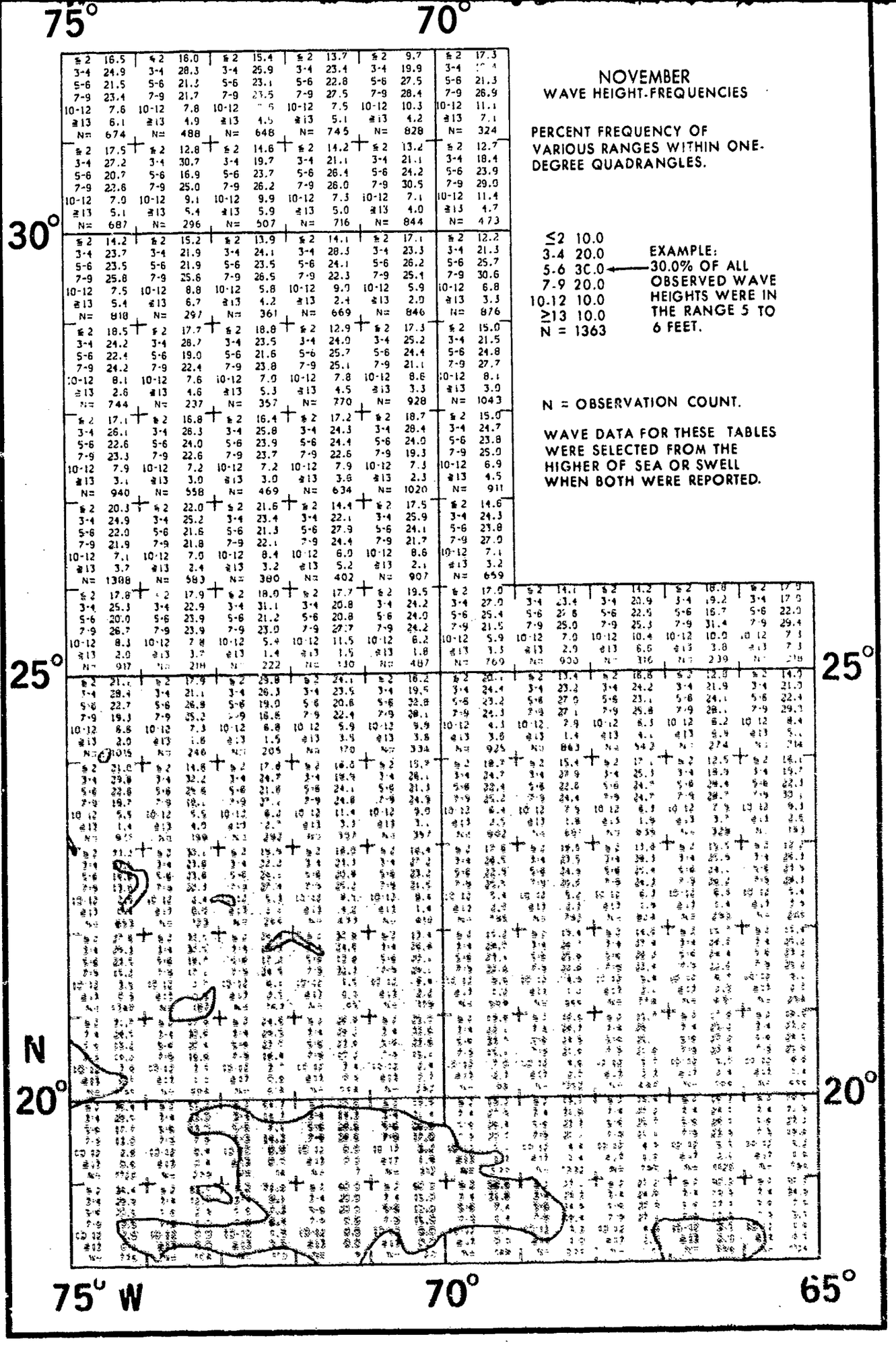

NOVEMBER
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
85° W
80°
75°

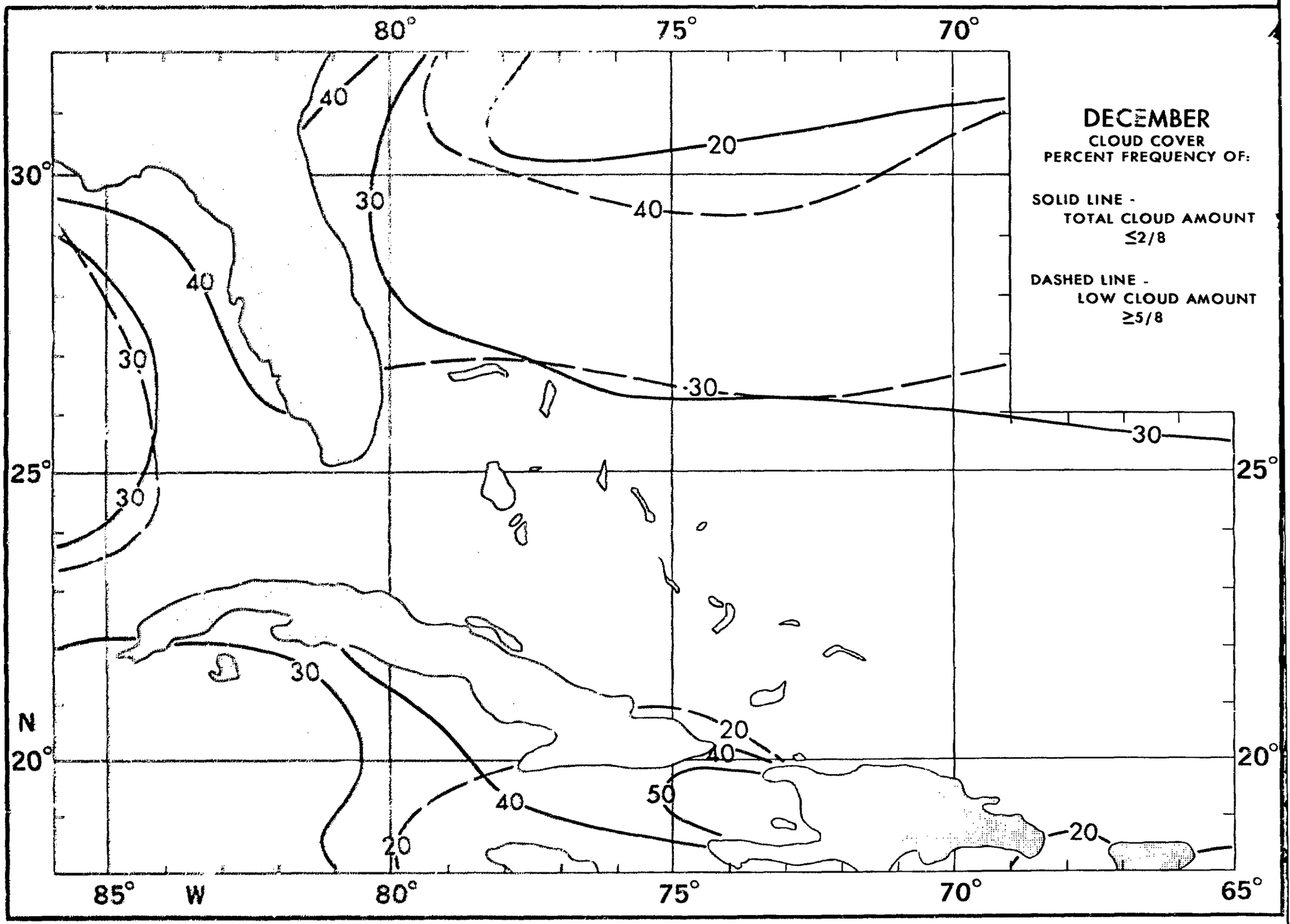

NOVEMBER
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.
30°
25°
20°
N
75° W
70°
65°

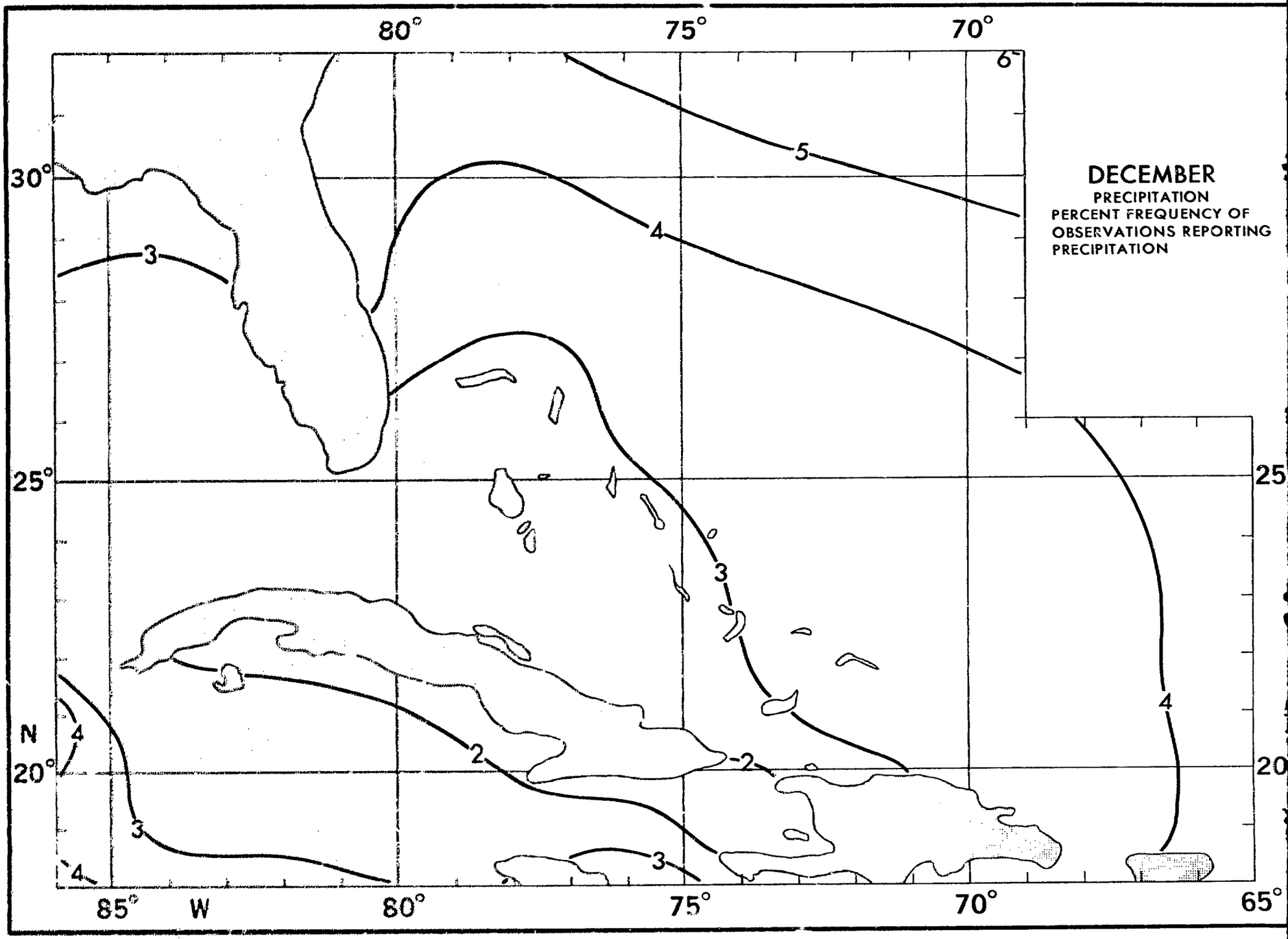

NOVEMBER
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°

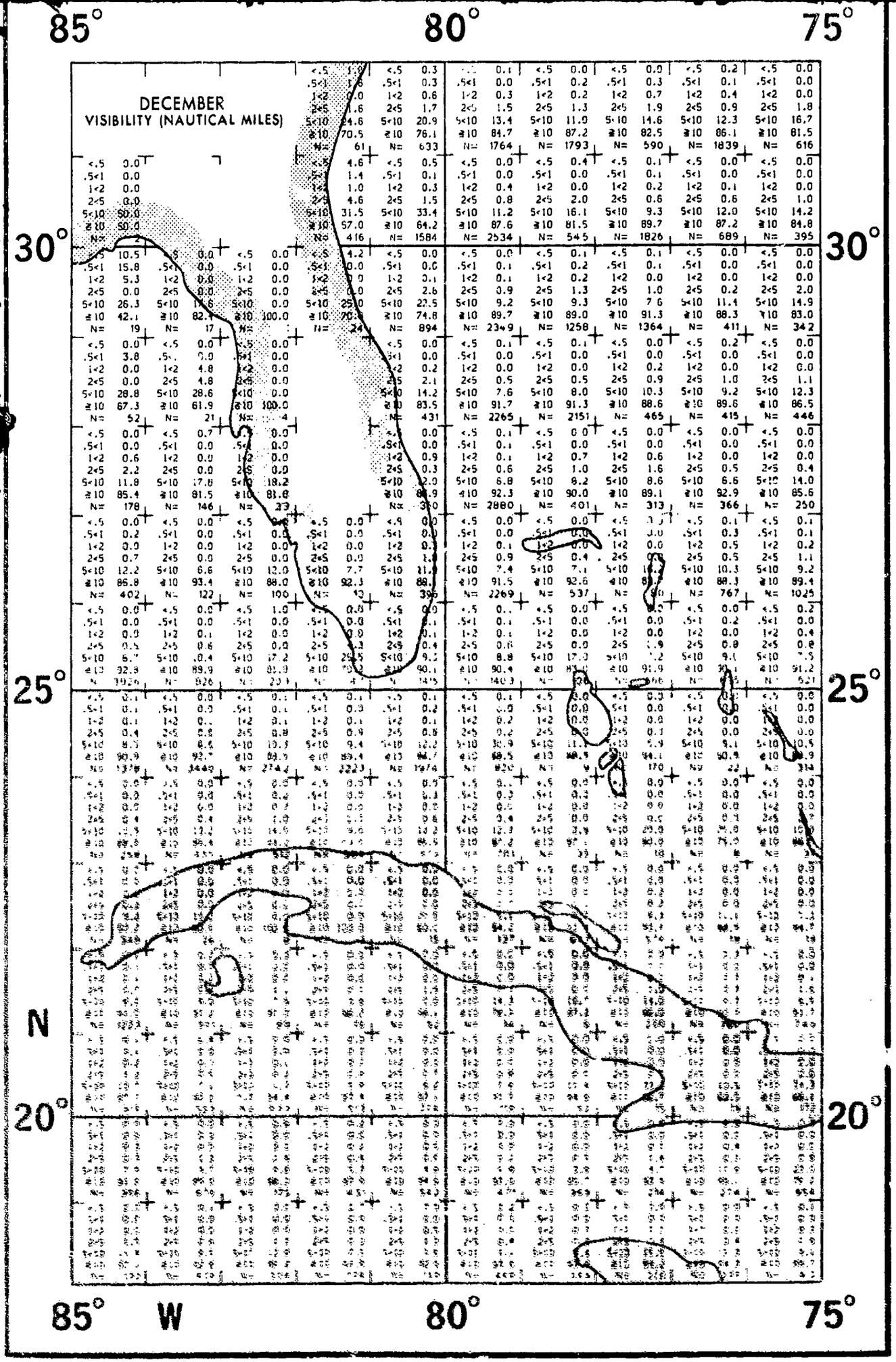

NOVEMBER
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEE
DASHED LINE -
WAVE HEIGHT ≥8 FEE
THE WAVE HEIGHT USED FO
THIS MAP IS THE HIGHER OF
SEA OR SWELL FOR OBSER-
VATIONS CONTAINING BOT
WAVE TRAINS.
SEA IS DEFINED AS WAVES
GENERATED BY LOCAL WIN
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65
10
20
30
40
50
60
70
80

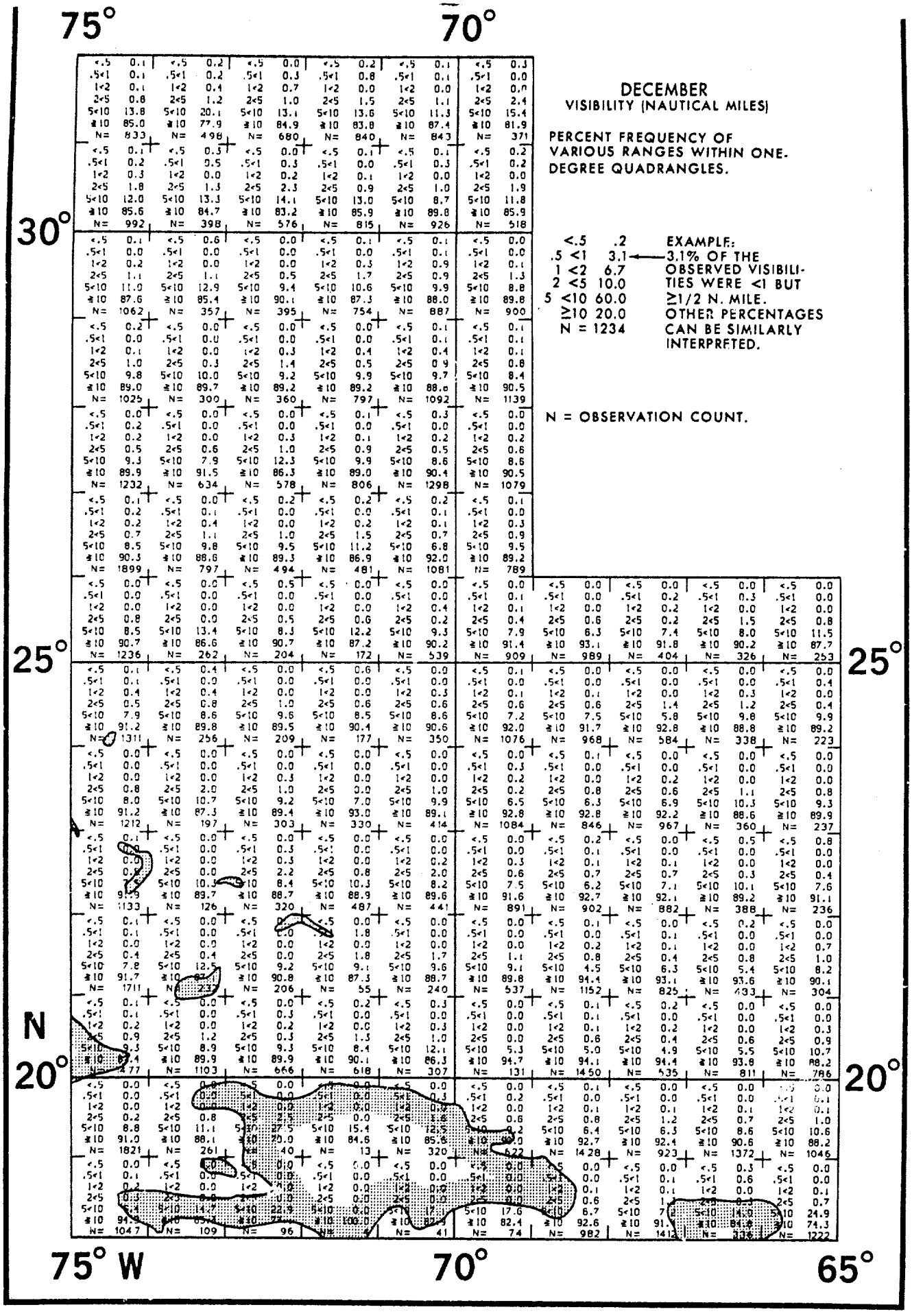

NOVEMBER
WAVE HEIGHT-FREQUENCIES
80°
75°
30°
25°
20°
N
85°
W


75°
70°
30°
25°
20°
N
75° W
70°
65°
NOVEMBER
WAVE HEIGHT-FREQUENCIES
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.
≤2 10.0
3-4 20.0
5-6 30.0
7-9 20.0
10-12 10.0
≥13 10.0
N = 1363
EXAMPLE: 30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.
N = OBSERVATION COUNT.
WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.


DECEMBER
CLOUD COVER
PERCENT FREQUENCY OF:
SOLID LINE -
TOTAL CLOUD AMOUNT
≤2/8
DASHED LINE -
LOW CLOUD AMOUNT
≥5/8
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
40
30
20
40
30
30
30
30
20
40
50
40
20
20


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
6
5
4
3
2
DECEMBER
PRECIPITATION
PERCENT FREQUENCY OF
OBSERVATIONS REPORTING
PRECIPITATION


DECEMBER
VISIBILITY (NAUTICAL MILES)
85°
80°
75°
30°
25°
20°
N
W



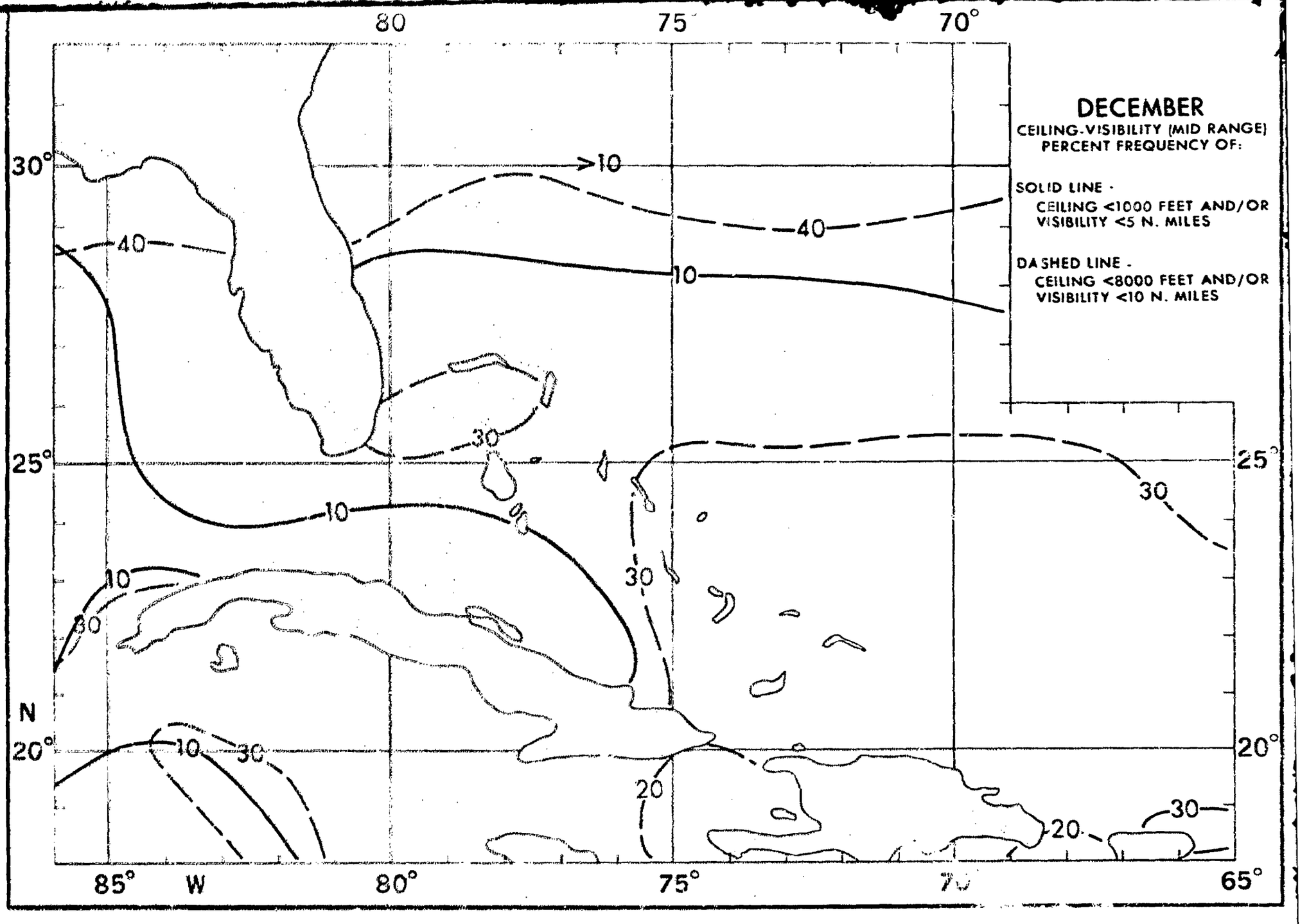
DECEMBER
VISIBILITY (NAUTICAL MILES)

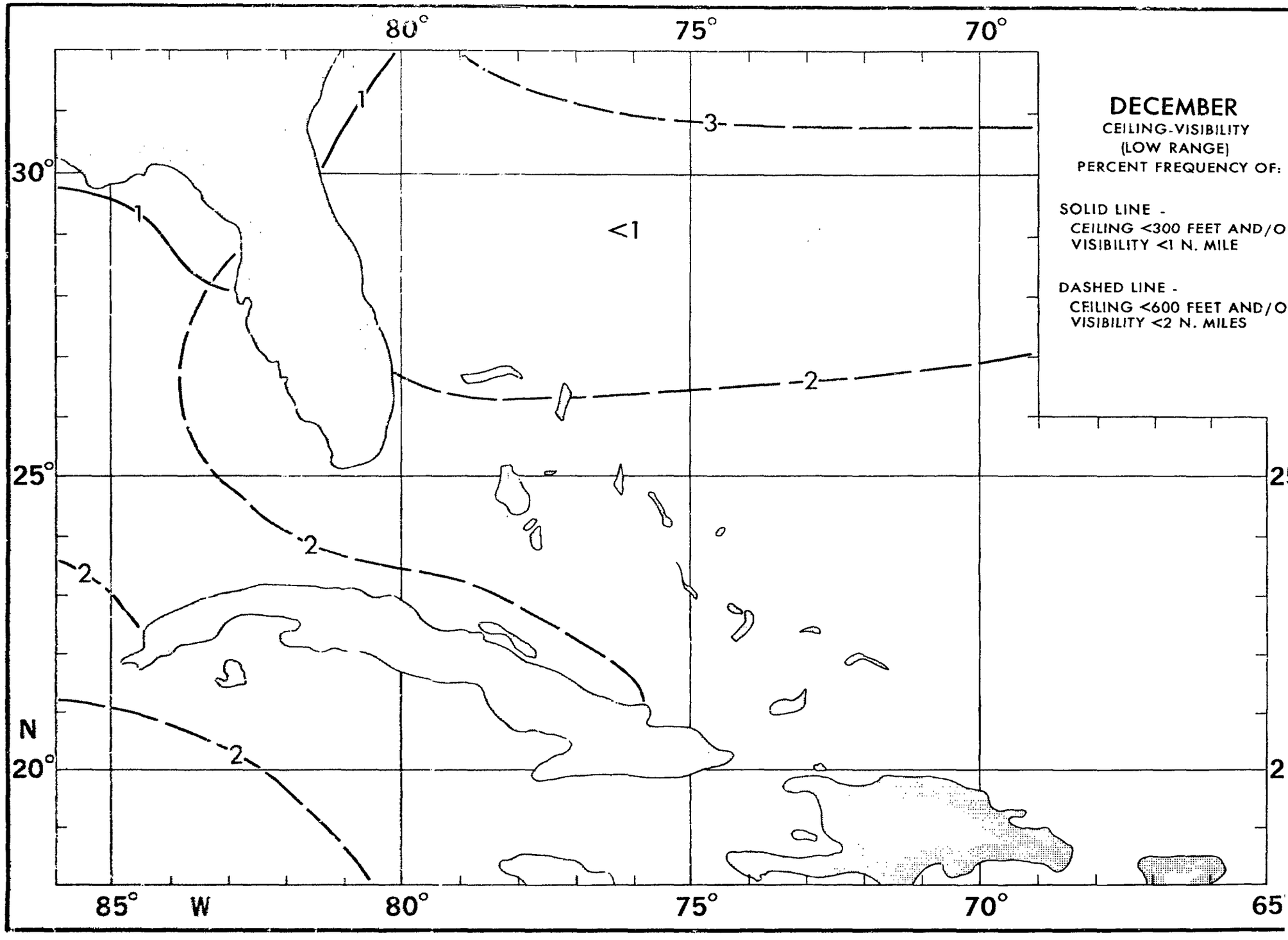
PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE. DEGREE QUADRANGLES.

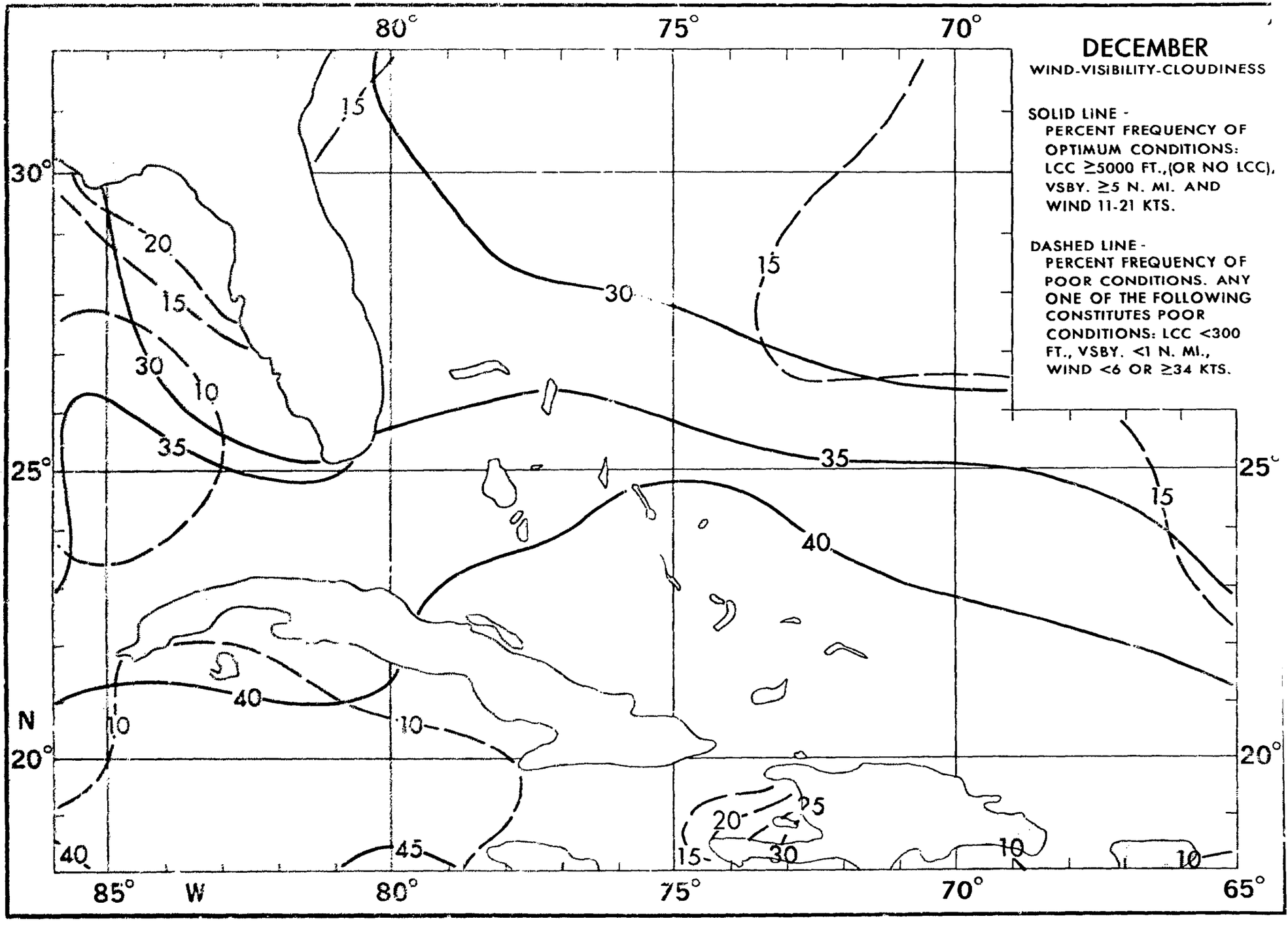
<.5	.2
.5 <1	3.1
1 <2	6.7
2 <5	10.0
5 <10	60.0
≥10	20.0
N =	1234

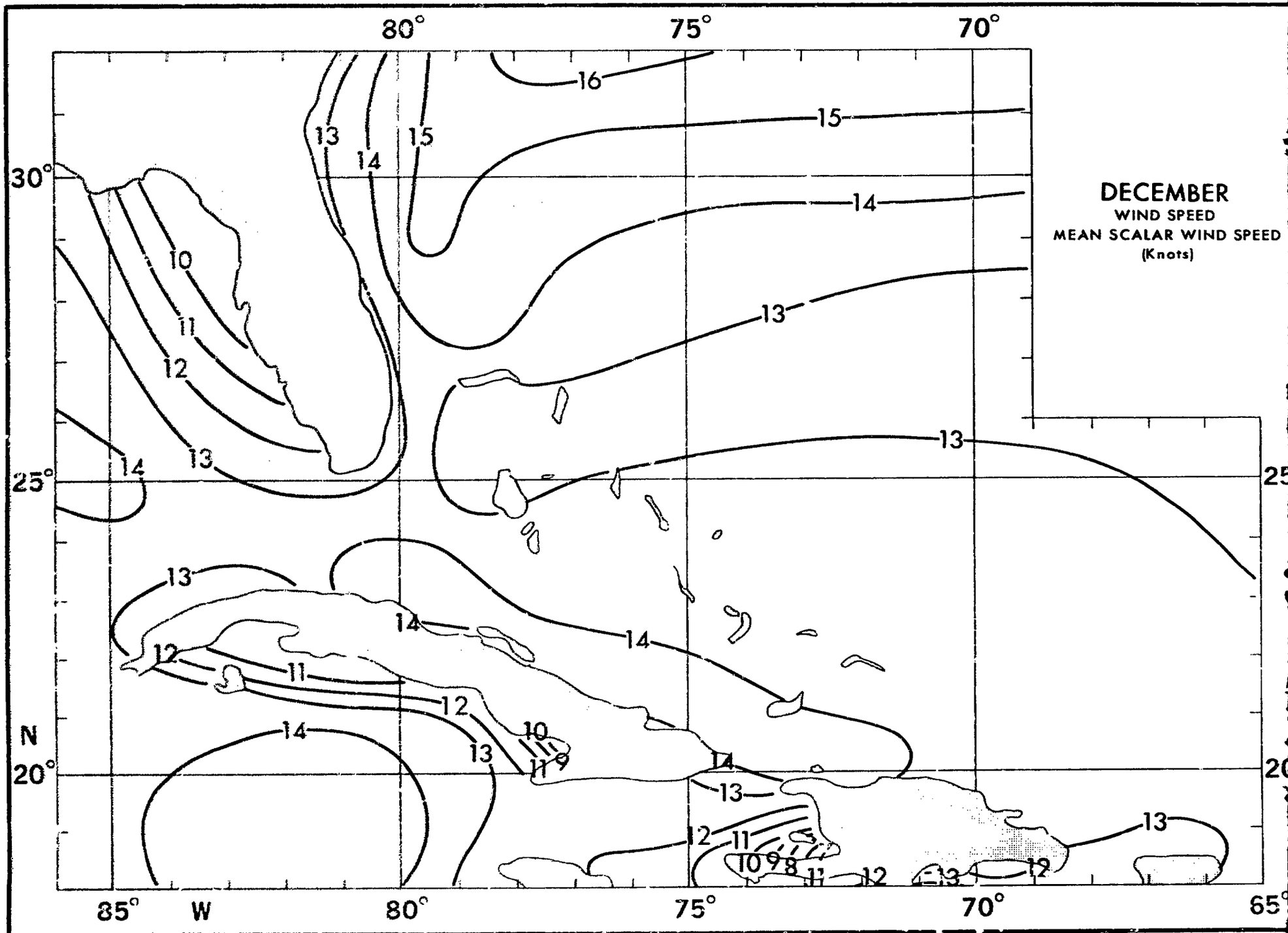
EXAMPLE: 3.1% OF THE OBSERVED VISIBILITIES WERE <1 BUT ≥1/2 N. MILE. OTHER PERCENTAGES CAN BE SIMILARLY INTERPRETED.

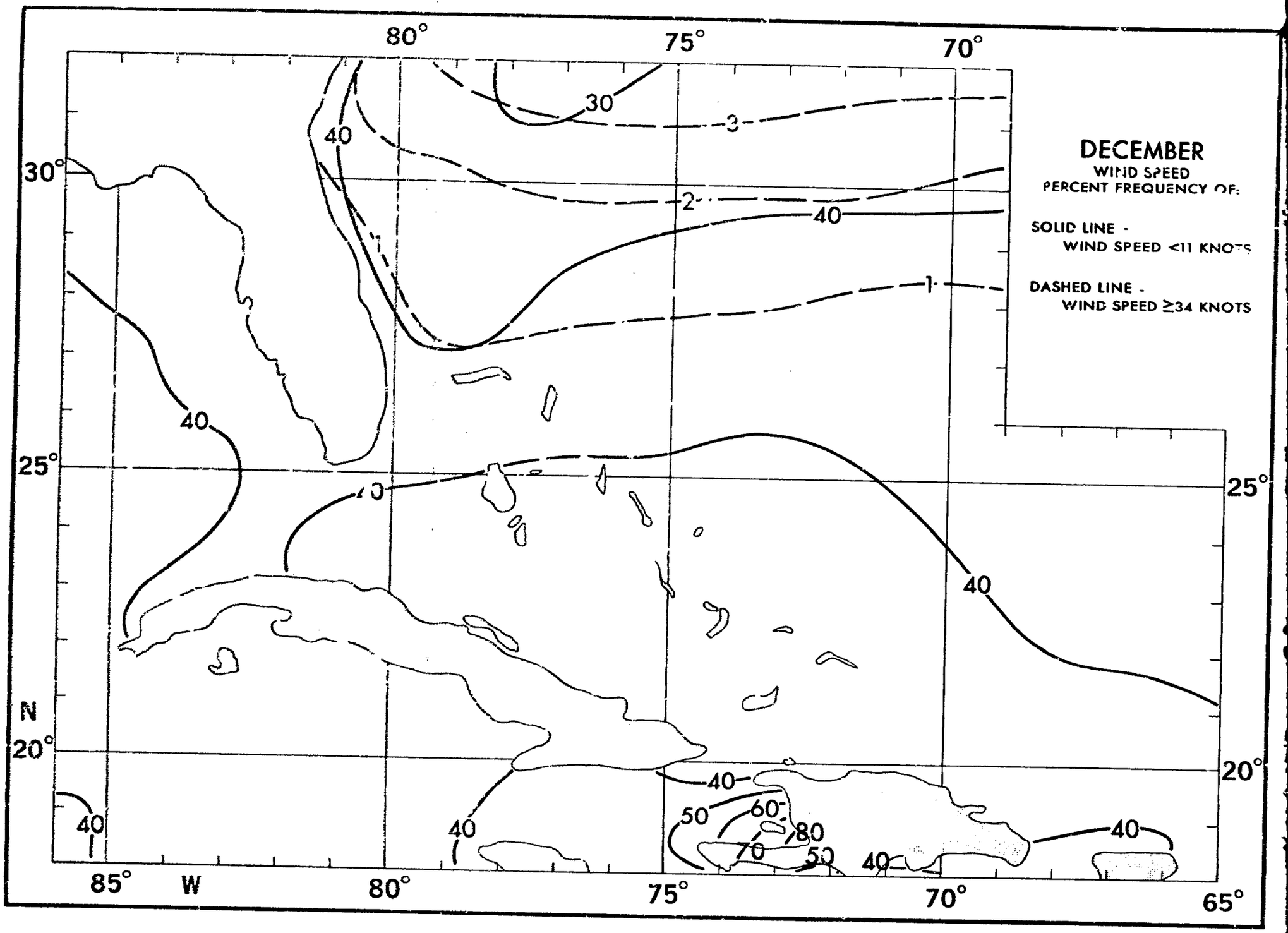
N = OBSERVATION COUNT.

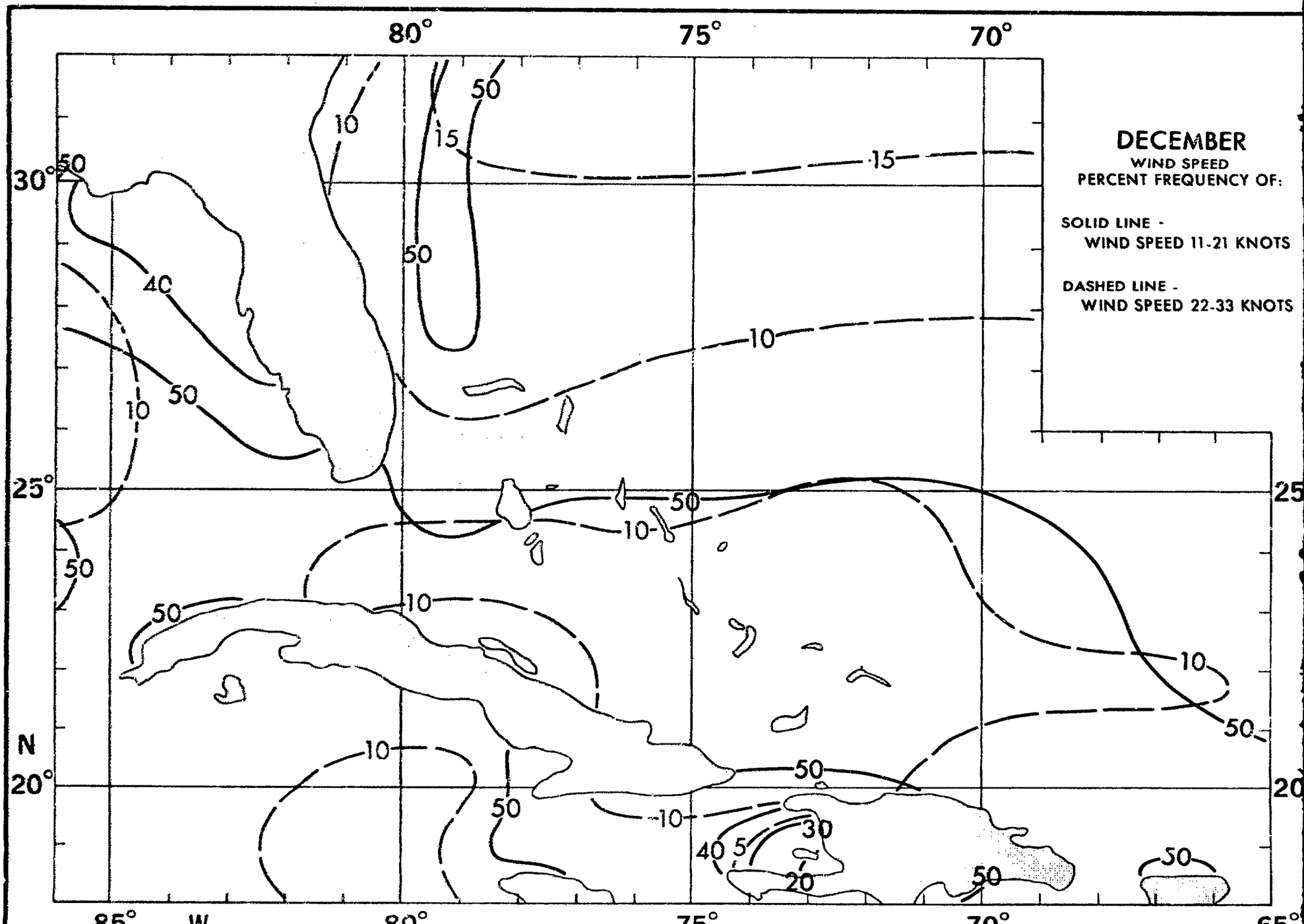

80
75
70°
30°
25°
20°
N
85°
W
80°
75°
65°
DECEMBER
CEILING-VISIBILITY (MID RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <1000 FEET AND/OR
VISIBILITY <5 N. MILES
DASHED LINE -
CEILING <8000 FEET AND/OR
VISIBILITY <10 N. MILES
>10
40
10
30
10
30
10
30
10
30
20
20
30

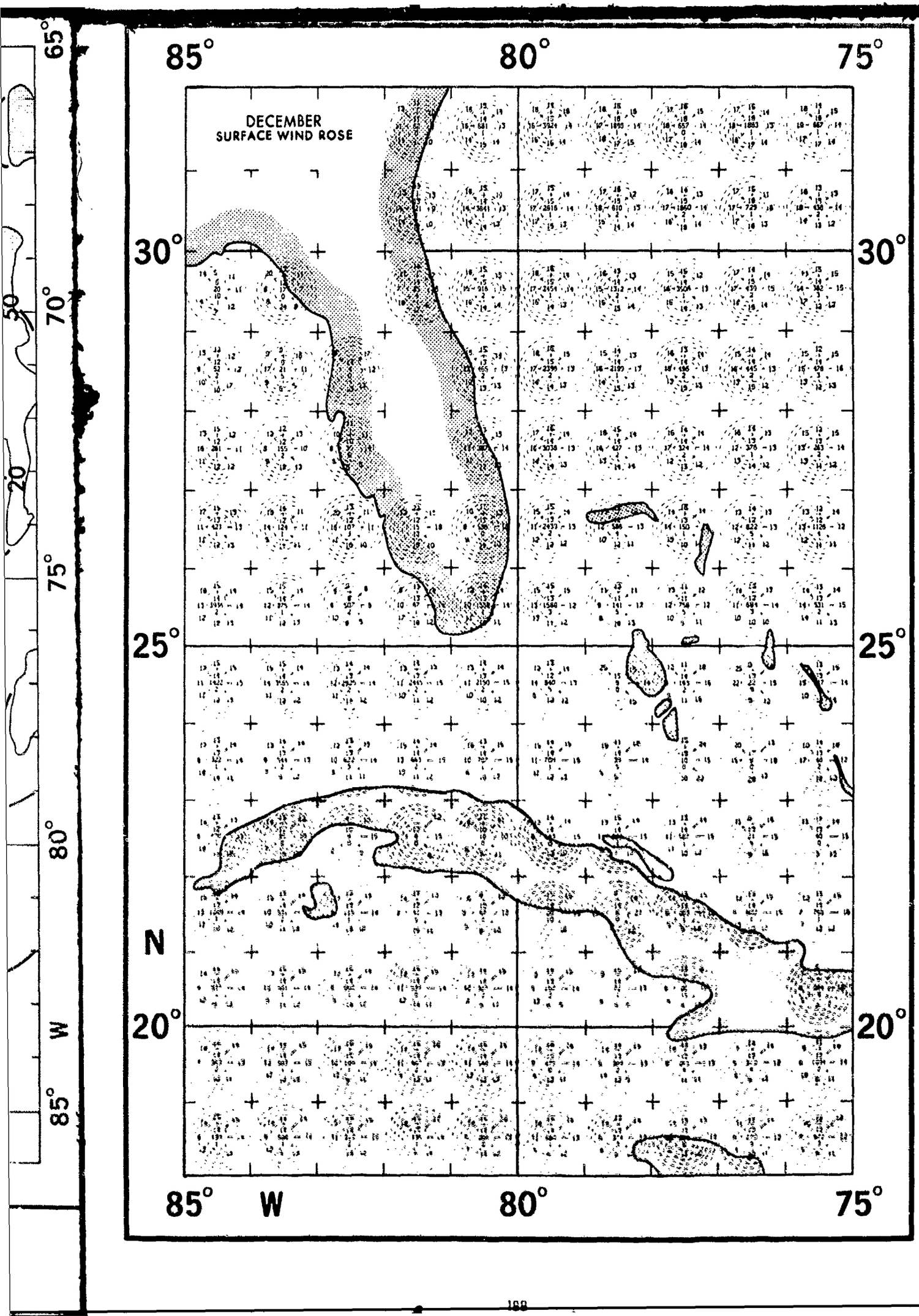

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65
1
3
1
<1
2
2
2
2
DECEMBER
CEILING-VISIBILITY
(LOW RANGE)
PERCENT FREQUENCY OF:
SOLID LINE -
CEILING <300 FEET AND/O
VISIBILITY <1 N. MILE
DASHED LINE -
CEILING <600 FEET AND/O
VISIBILITY <2 N. MILES

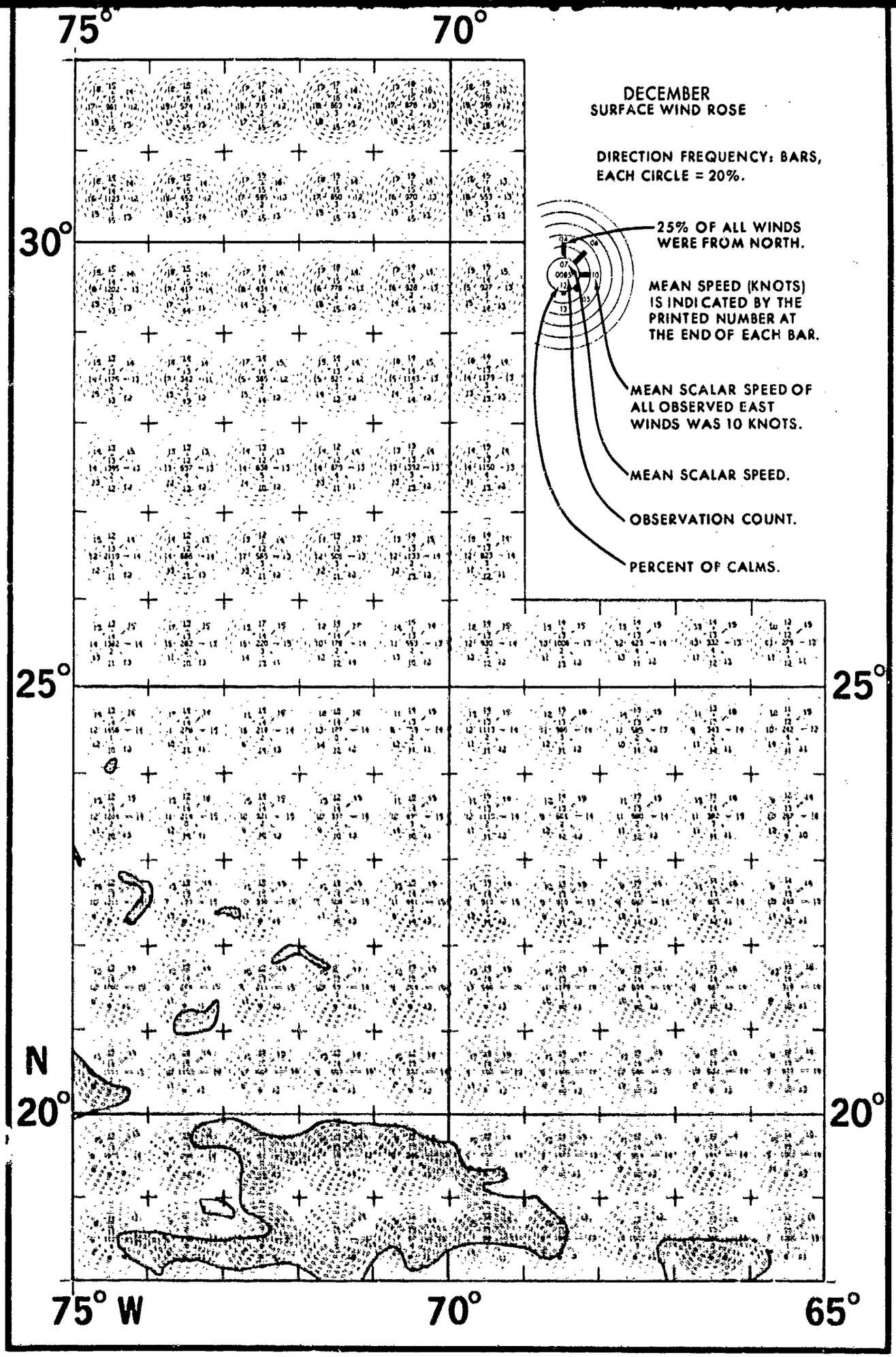

DECEMBER
WIND-VISIBILITY-CLOUDINESS
SOLID LINE -
PERCENT FREQUENCY OF OPTIMUM CONDITIONS: LCC ≥5000 FT.,(OR NO LCC), VSBY. ≥5 N. MI. AND WIND 11-21 KTS.
DASHED LINE -
PERCENT FREQUENCY OF POOR CONDITIONS. ANY ONE OF THE FOLLOWING CONSTITUTES POOR CONDITIONS: LCC <300 FT., VSBY. <1 N. MI., WIND <6 OR ≥34 KTS.
80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°
15
20
15
30
10
35
30
15
35
15
40
40
10
10
40
45
15
20
25
30
10
10

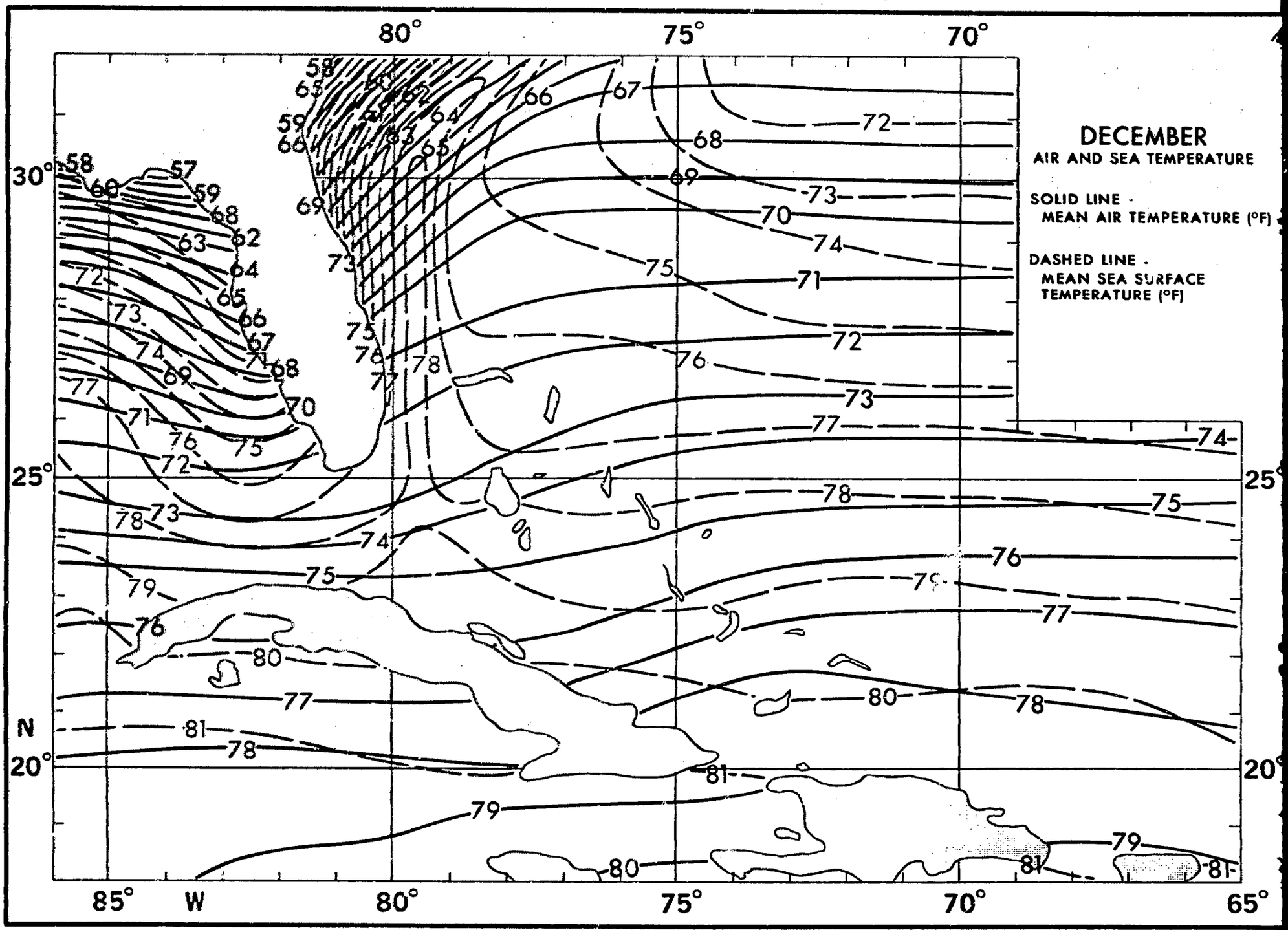

80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
DECEMBER
WIND SPEED
MEAN SCALAR WIND SPEED
(Knots)

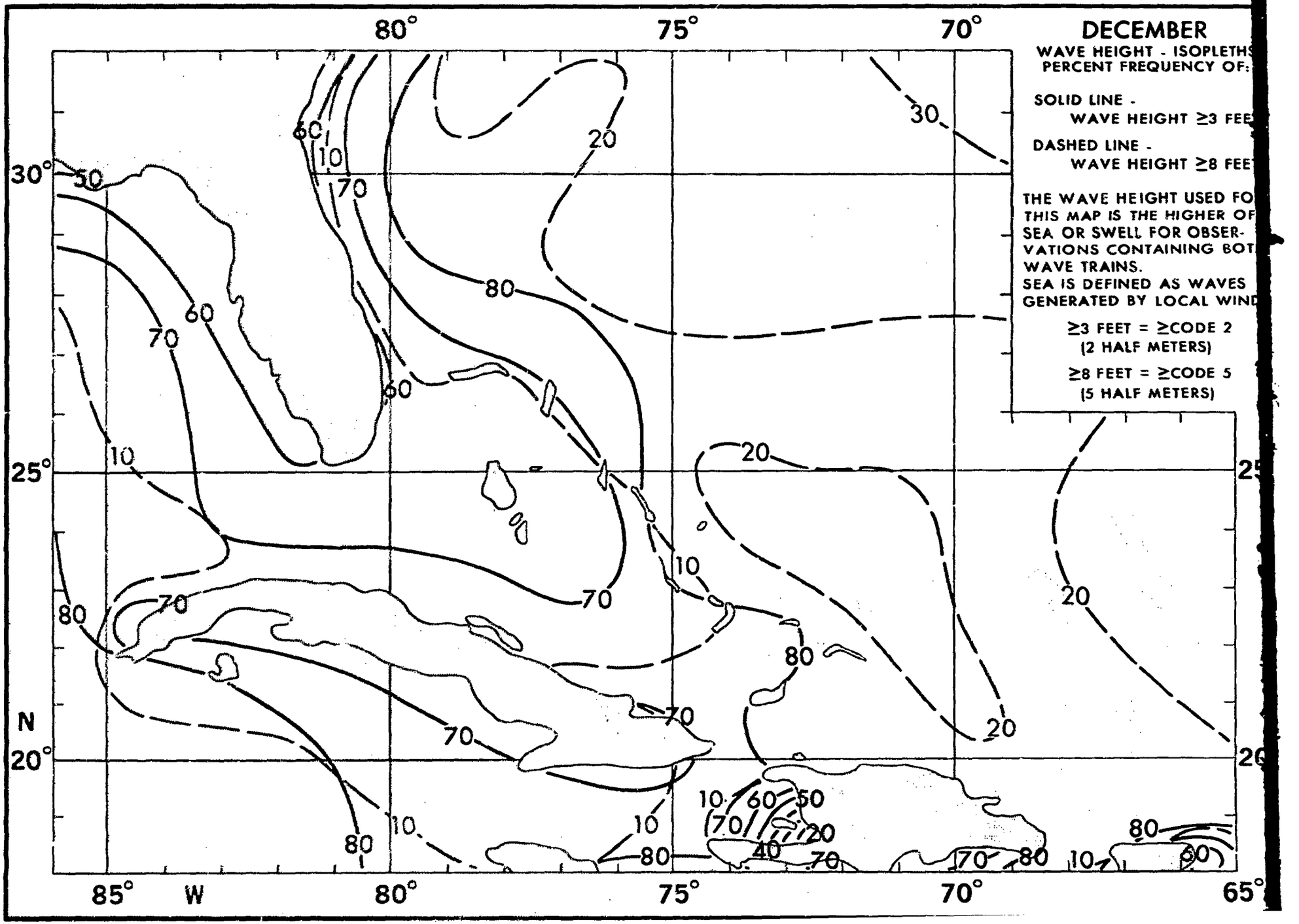

80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°
30
3
40
2
1
DECEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED <11 KNOTS
DASHED LINE -
WIND SPEED ≥34 KNOTS
40
50
60
80
70

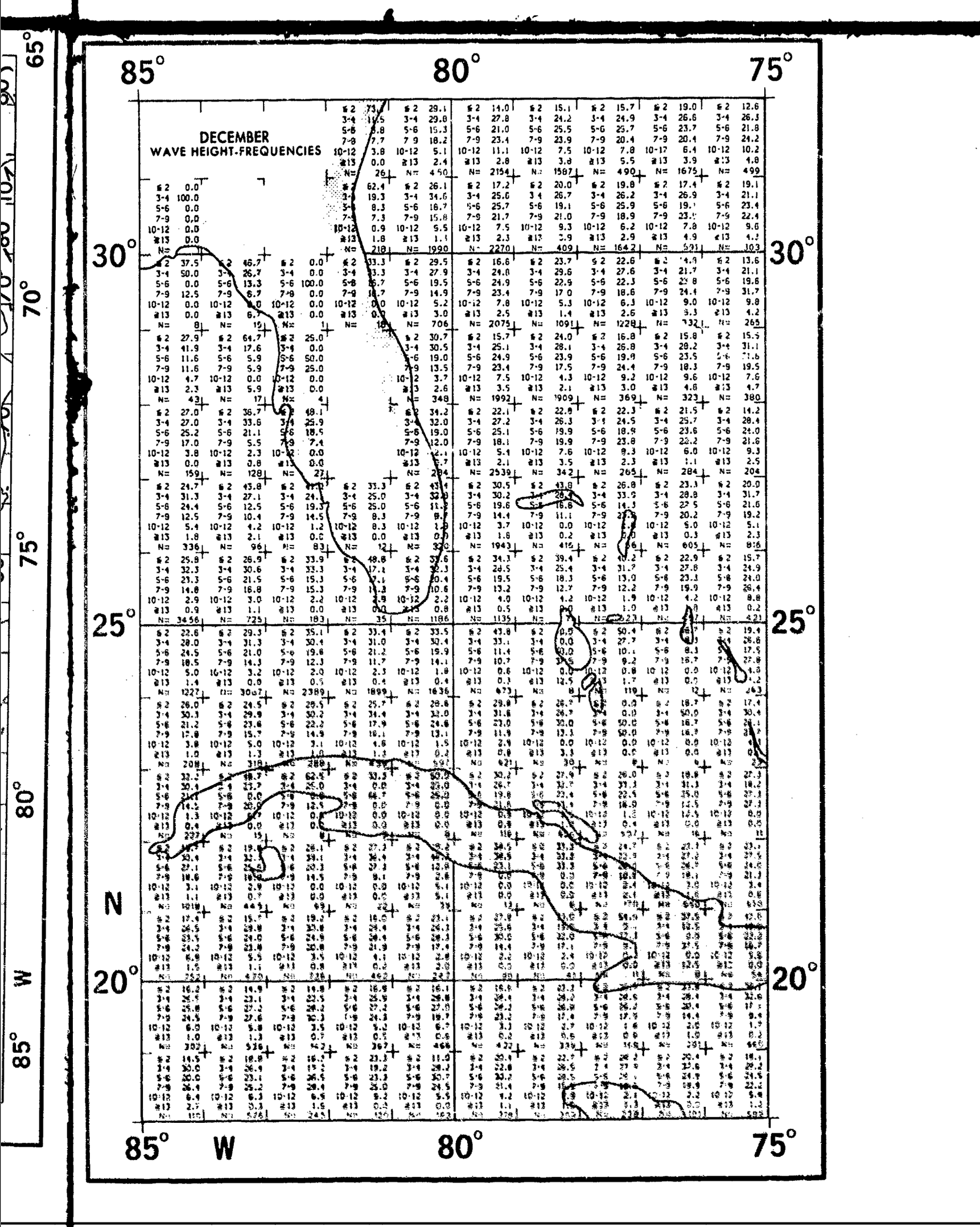

80°
75°
70°
30°
25°
20°
N
85° W
80°
75°
70°
65°
DECEMBER
WIND SPEED
PERCENT FREQUENCY OF:
SOLID LINE -
WIND SPEED 11-21 KNOTS
DASHED LINE -
WIND SPEED 22-33 KNOTS
10
15
50
40
5
30
20

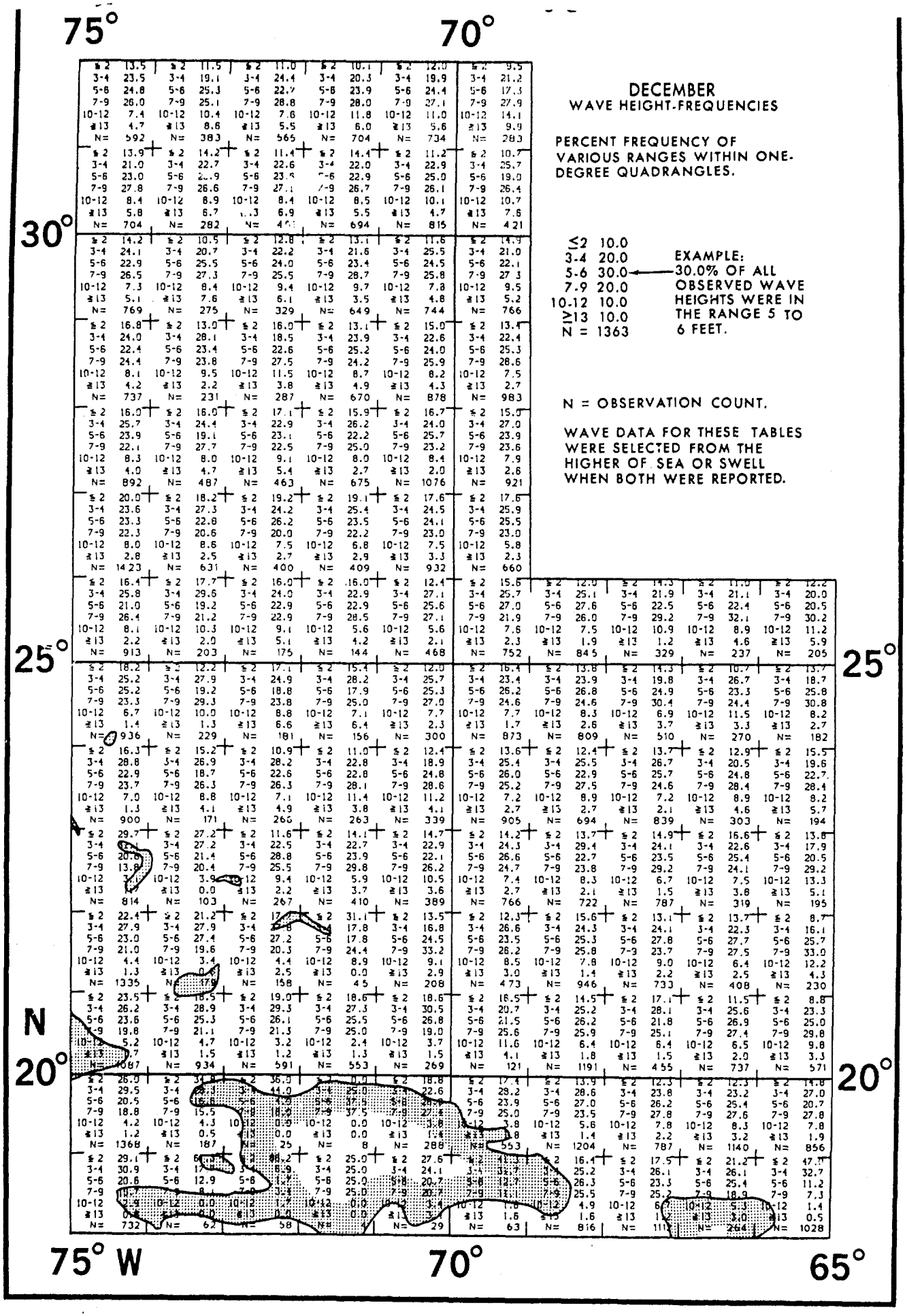

DECEMBER
SURFACE WIND ROSE
85°
80°
75°
30°
25°
20°
N
W


75°
70°
30°
25°
20°
N
75° W
70°
65°
DECEMBER
SURFACE WIND ROSE
DIRECTION FREQUENCY: BARS, EACH CIRCLE = 20%.
25% OF ALL WINDS WERE FROM NORTH.
MEAN SPEED (KNOTS) IS INDICATED BY THE PRINTED NUMBER AT THE END OF EACH BAR.
MEAN SCALAR SPEED OF ALL OBSERVED EAST WINDS WAS 10 KNOTS.
MEAN SCALAR SPEED.
OBSERVATION COUNT.
PERCENT OF CALMS.


DECEMBER
AIR AND SEA TEMPERATURE
SOLID LINE -
MEAN AIR TEMPERATURE (°F)
DASHED LINE -
MEAN SEA SURFACE
TEMPERATURE (°F)
80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°


DECEMBER
WAVE HEIGHT - ISOPLETHS
PERCENT FREQUENCY OF:
SOLID LINE -
WAVE HEIGHT ≥3 FEE
DASHED LINE -
WAVE HEIGHT ≥8 FEE
THE WAVE HEIGHT USED FO
THIS MAP IS THE HIGHER OF
SEA OR SWELL FOR OBSER-
VATIONS CONTAINING BOT
WAVE TRAINS.
SEA IS DEFINED AS WAVES
GENERATED BY LOCAL WIND
≥3 FEET = ≥CODE 2
(2 HALF METERS)
≥8 FEET = ≥CODE 5
(5 HALF METERS)
80°
75°
70°
30°
25°
N
20°
85°
W
80°
75°
70°
65°


DECEMBER
WAVE HEIGHT-FREQUENCIES
85°
80°
75°
30°
25°
20°
N
W



DECEMBER
WAVE HEIGHT-FREQUENCIES

PERCENT FREQUENCY OF VARIOUS RANGES WITHIN ONE-DEGREE QUADRANGLES.

≤2	10.0
3-4	20.0
5-6	30.0
7-9	20.0
10-12	10.0
≥13	10.0
N =	1363

EXAMPLE: 30.0% OF ALL OBSERVED WAVE HEIGHTS WERE IN THE RANGE 5 TO 6 FEET.

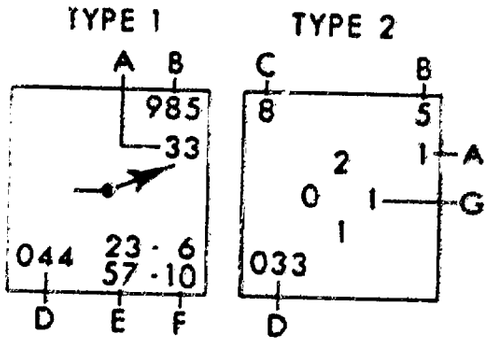
N = OBSERVATION COUNT.

WAVE DATA FOR THESE TABLES WERE SELECTED FROM THE HIGHER OF SEA OR SWELL WHEN BOTH WERE REPORTED.

SURFACE CURRENTS

Data Presentation

The following legend shows two types of surface current presentations by 1° quadrangle, type 1 with 12 or more observations and type 2 with fewer than 12 observations. Where there are 11 or fewer observations within a 1° quadrangle, the total number of observations is shown within the 90° quadrant containing the observations.



A Number of calms (included in total observations).

B Total observations

C Mean speed (0.8 knot) for all observations.

D Vector resultant direction (°T) for all observations.

E Percent frequencies (57% primary direction, 23% secondary direction).

F Mean speeds (1.0 knot primary direction, 0.6 knot secondary direction).

G Number of observations by quadrant.

Type 1 - If there are 12 or more non-calm observations in a 1° quadrangle, the surface current is depicted by vector resultants as follows:

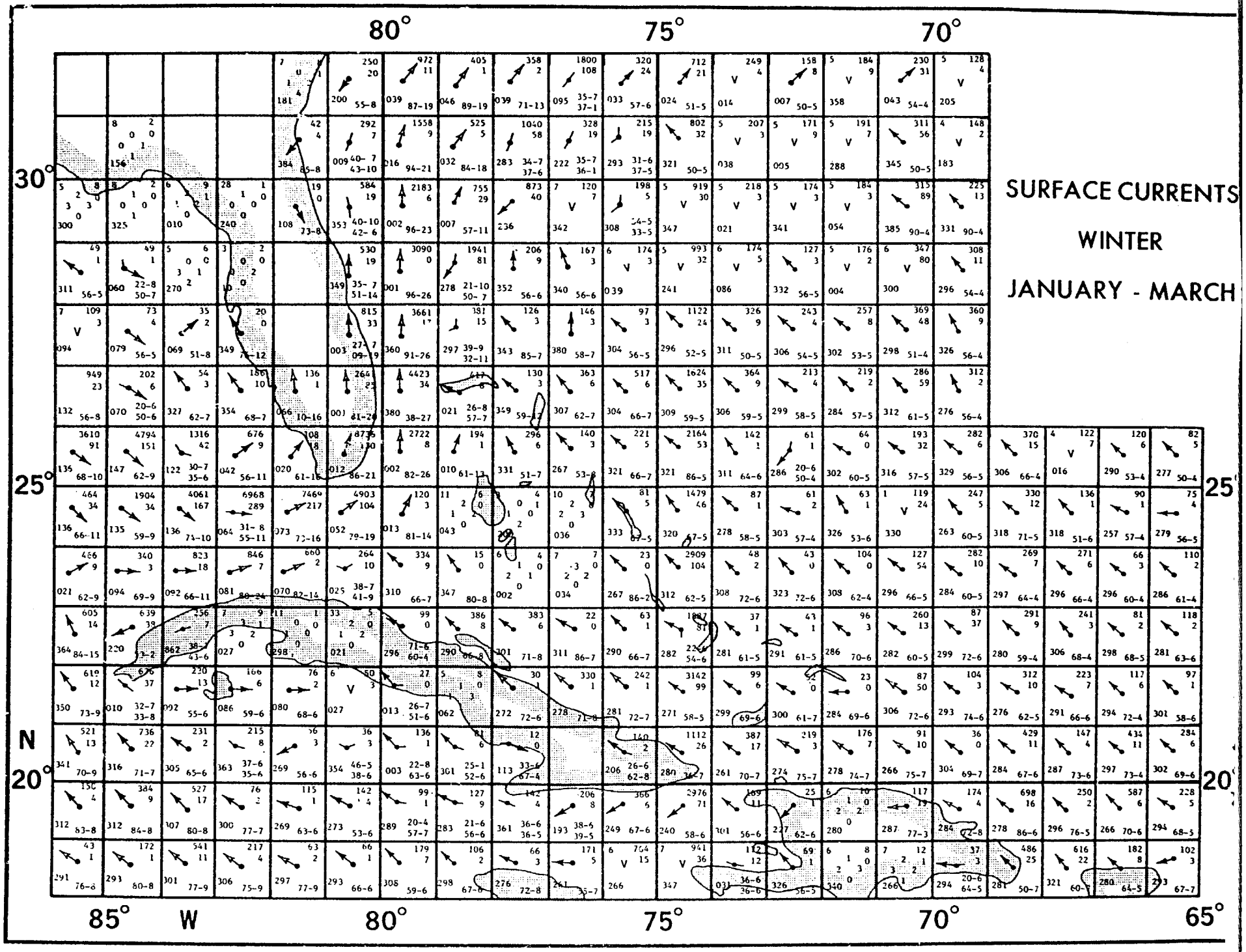
Persistent Current - 60 percent or more of all observations fall within a 45° sector of the 8-point compass.

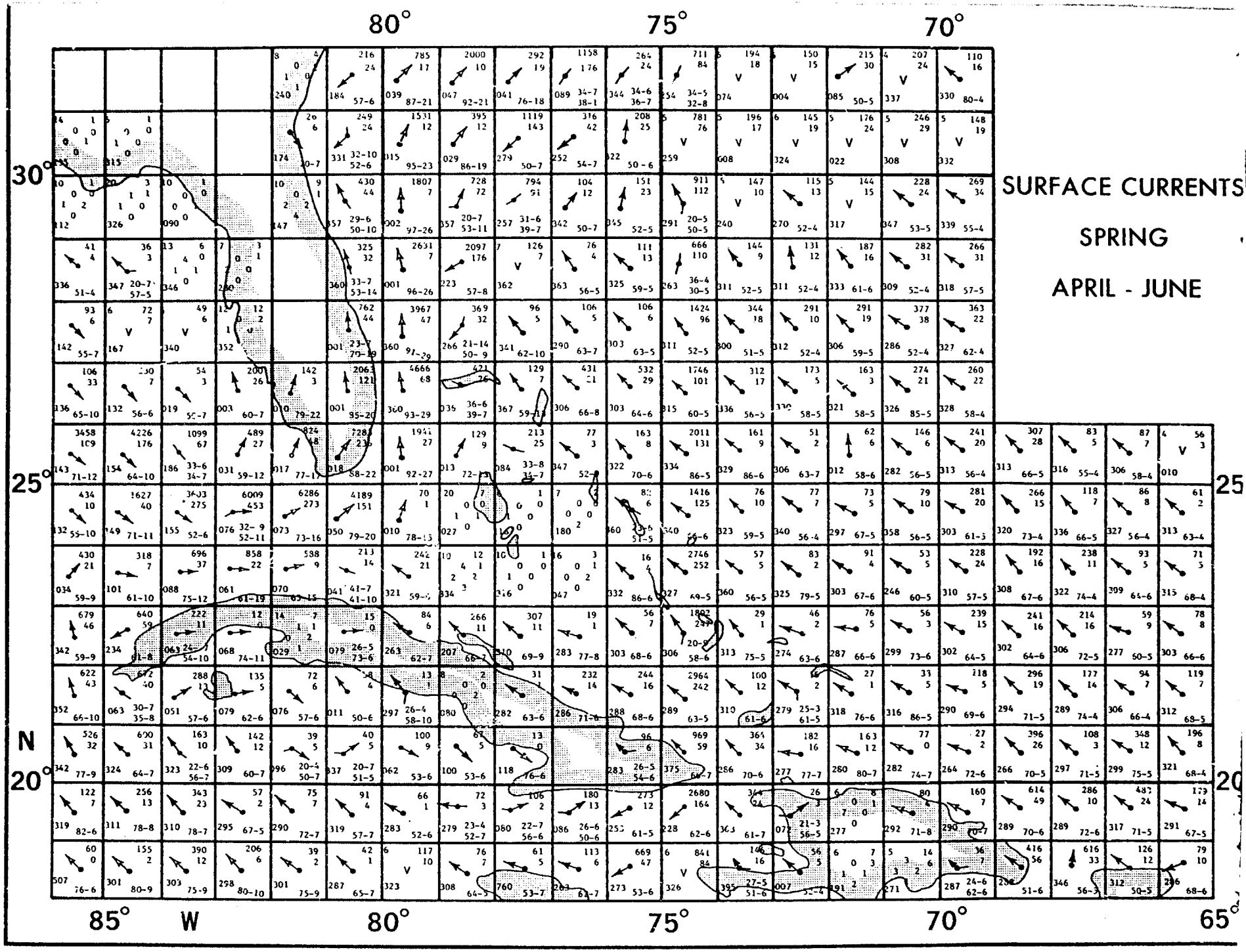
Primary Current with Secondary Direction -
Primary Current - 50 percent or more of all observations fall within three adjacent 45° sectors.
Secondary Direction - 20 percent or more of all observations fall within a 45° sector, and the two resultant vector directions are separated by more than 90° of arc.

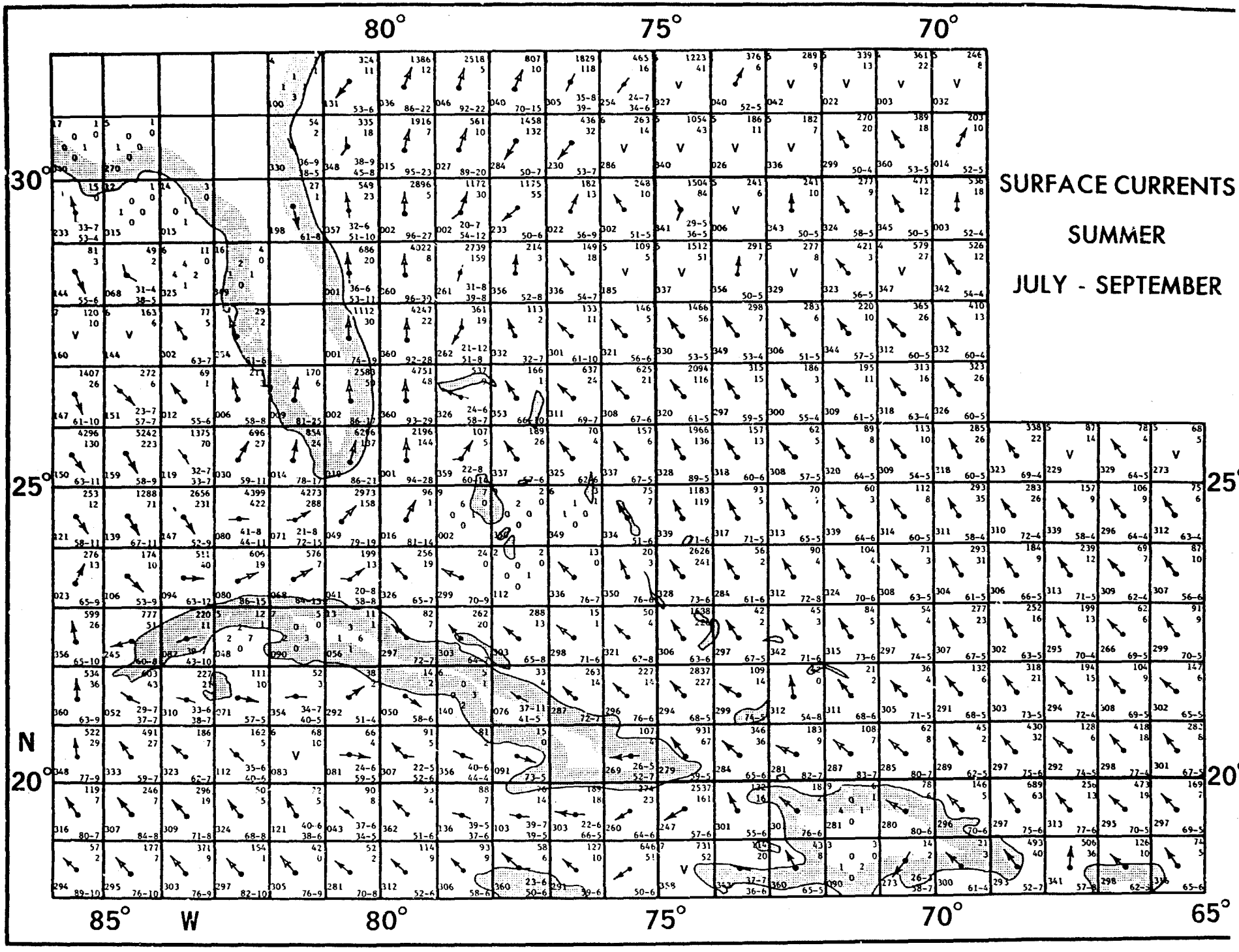
Prevailing Current - 70 percent or more of all observations fall within two adjacent 45° sectors.

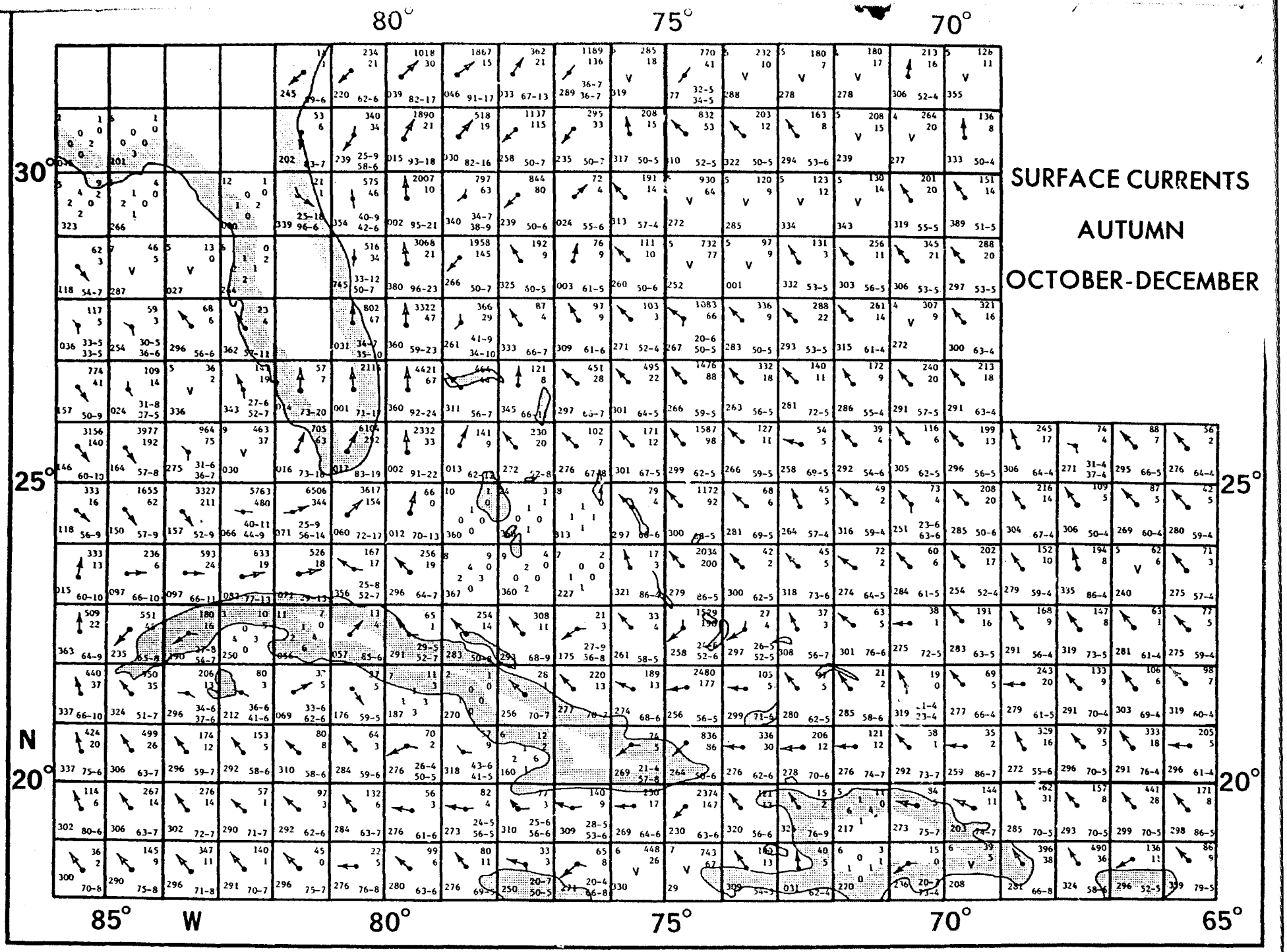
Bizonal Flow - Practically all observations are concentrated in opposite pairs of 45° sectors, and one pair contains at least 80 percent as many observations as the opposite pair. This generally indicates variability that occurs in zones of entrainment between opposing currents.

V Variable Current - The 45° sector with most observations has less than 25 percent of all observations; direction is indeterminate.


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
SURFACE CURRENTS
WINTER
JANUARY - MARCH


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
SURFACE CURRENTS
SPRING
APRIL - JUNE


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
SURFACE CURRENTS
SUMMER
JULY - SEPTEMBER


80°
75°
70°
30°
25°
20°
N
85°
W
80°
75°
70°
65°
SURFACE CURRENTS
AUTUMN
OCTOBER-DECEMBER